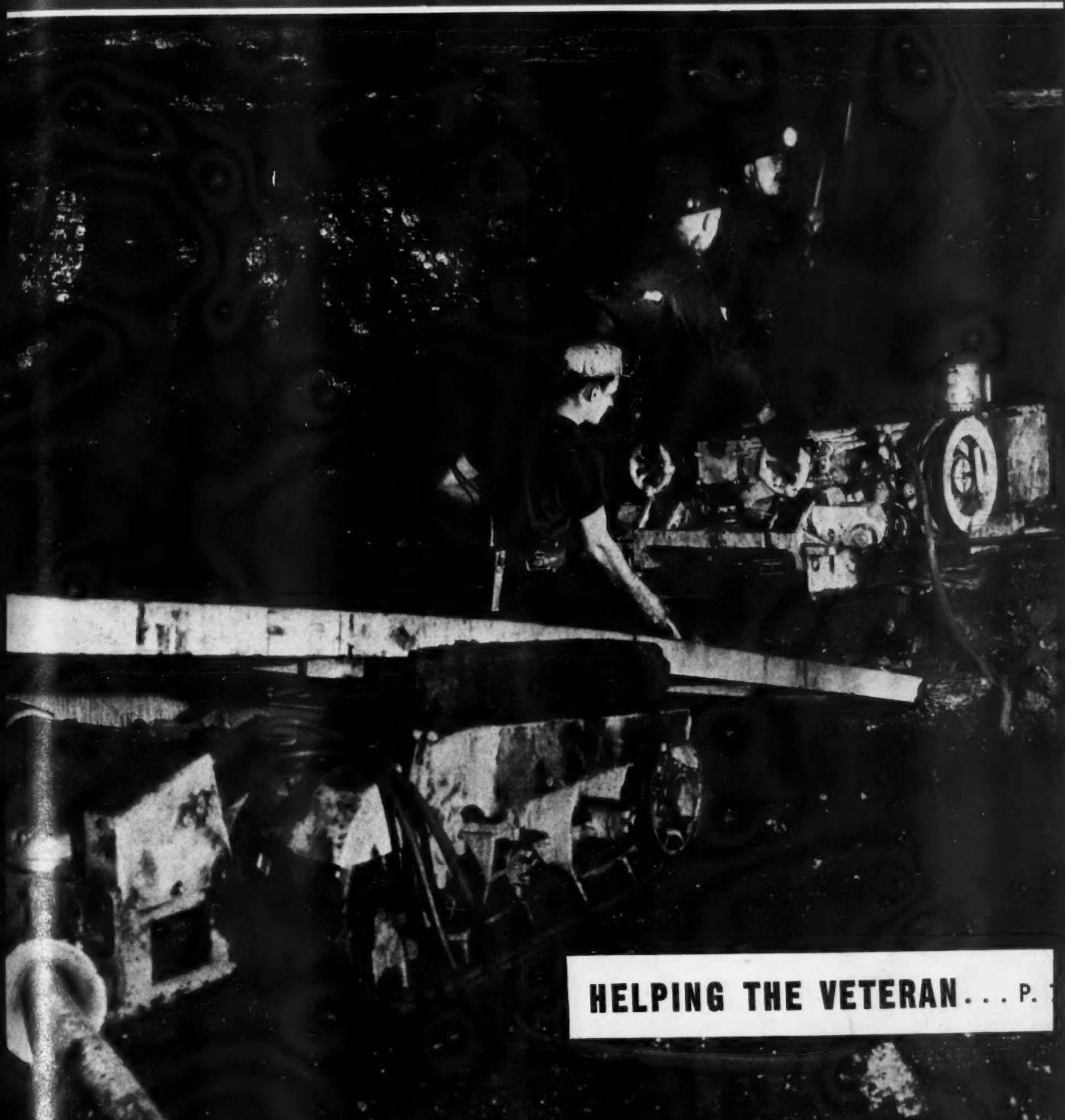
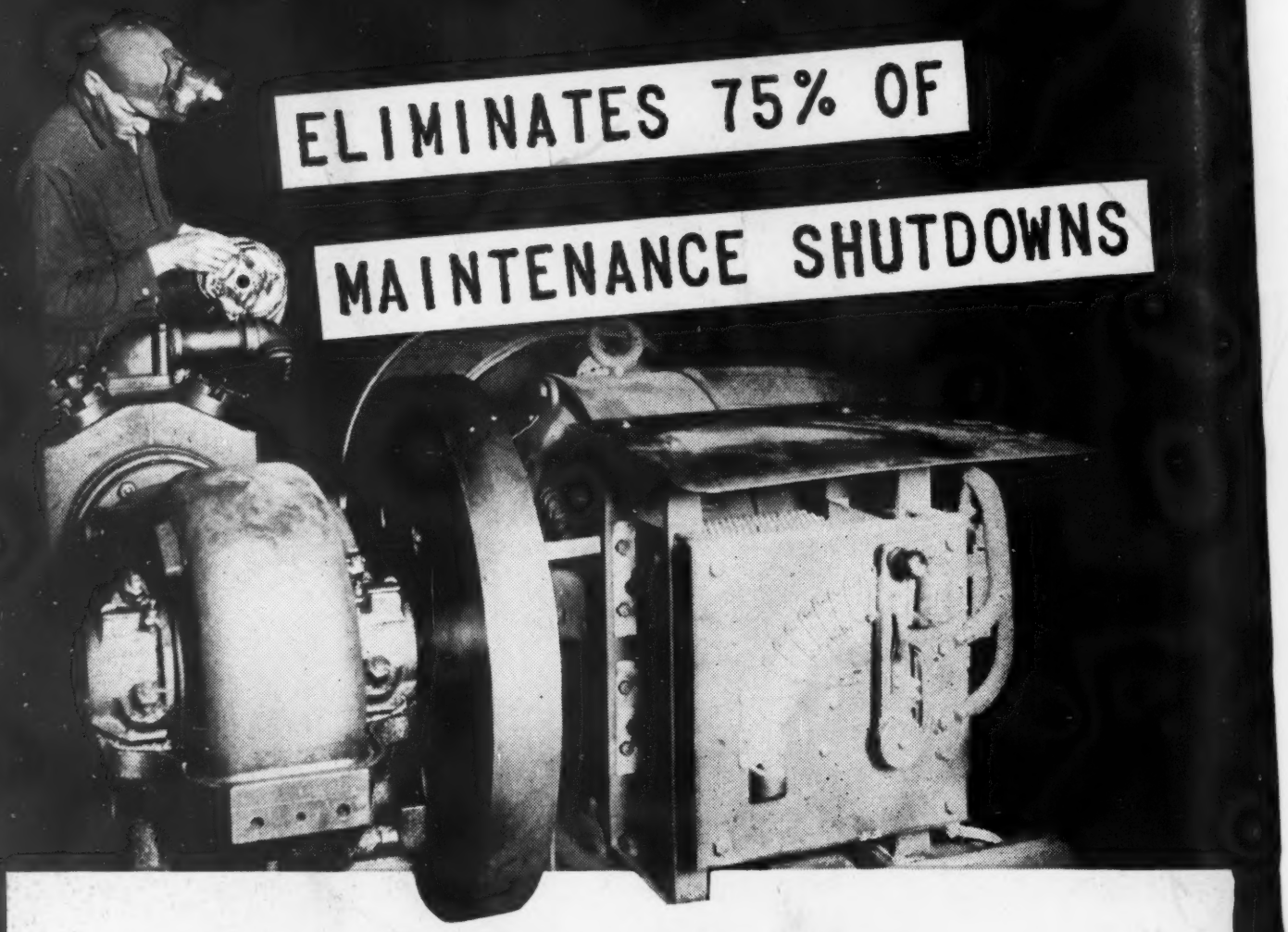
Coal Age

JULY, 1945



HELPING THE VETERAN . . . P.



SUN MINE LUBRICANT...

Ends Carbon and Gum Trouble on Compressor-Valves and Rings

A veteran compressor was put back into steady service, lubricated with a nationally known competitive brand of oil. But rings and valves gummed-up continually and were coated with carbon. Shutdowns for cleaning took place every two or three weeks.

A Sun Engineer was called in, and, after studying the case, suggested one of Sun's Solnus oils. Since then, gum and carbon have been practically nil. Shutdowns are held to every three months, only one-fourth as often.

In every mine, every piece of equipment has to operate 100% or tonnage falls off. Ana often the use of the right oil for engines, compressors, hoists, air-tools, and other equipment will make the difference between making and missing the quotas.

Call in the Sun Engineer in your neighborhood. His experience may help you keep things going 24 hours a day, 365 days a year. Call him, or write direct to . . .

SUN OIL COMPANY • *Philadelphia 3, Pa.*

Sponsors of the Sunoco News Voice of the Air—Lowell Thomas

SUNOCO

SUN INDUSTRIAL PRODUCTS

OILS FOR AMERICAN INDUSTRY

Rubber "coal shovel" — a ton a minute!

A typical example of B. F. Goodrich development in rubber

MANPOWER and coal were two of the most critical commodities during this year's bitter winter. An equipment manufacturer developed a machine that would save manpower by handling coal easier and faster. Called a Hercules power chute, it would unload coal on a conveyor belt 8 inches wide at the rate of a *ton a minute*. It was light weight—could be handled by one man. It could *hurl* the coal into the basement—keep it from piling up at the window. It could pour coal through a window more than six feet high—a 28-degree grade.

But the ton-a-minute rate called for extra high belt speed—so fast that a smooth-surfaced belt would slip beneath the coal, let it pile up and spill to the ground. On an incline, even at lower speed, the coal would slide down the belt and over the sides of the chute.

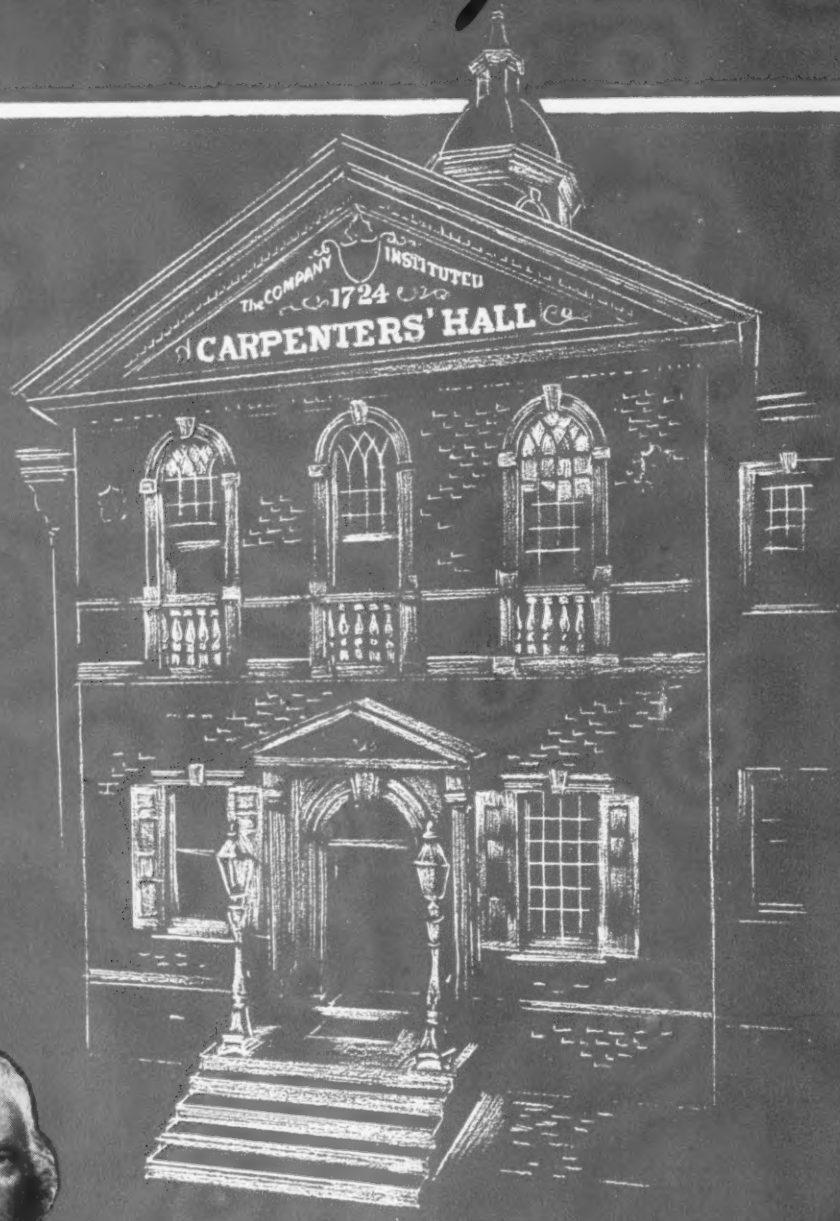
The manufacturer asked B. F. Goodrich engineers for help. They had already developed a belt called "Grip-top" for handling cartons and bags. Its grip came from thousands of tiny rubber "fingers" on the belt's surface. The engineers studied the coal conveyor—then submitted a sample belt with a new surface design that would grip large and small lumps of coal firmly. Tests were run and coal started moving—fast. Today hundreds of these rubber "coal shovels" are moving thousands of tons of coal each day—quickly and cleanly; saving time, money, manpower.

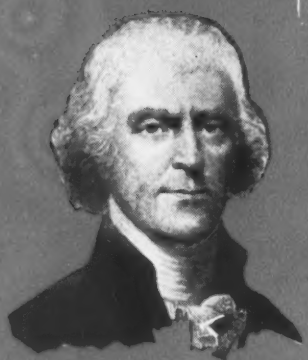
Whether it's conveyor belt or transmission belt; tank lining or sandblast hose; gasket or rubber printing plate—no B. F. Goodrich product is ever accepted as "standard" by B. F. Goodrich development men as long as there is a chance for improvement through further research. *The B.F.Goodrich Company, Industrial Products Division, Akron, Ohio.*

B.F. Goodrich

RUBBER *and* SYNTHETIC *products*

to do one thing and do it





The Declaration of Independence was drafted in Philadelphia in 1776, by a committee of five, headed by Thomas Jefferson. Around a conference table in Carpenters' Hall the discussions were held. Then the five-man group turned to Jefferson to write the article—a job he did supremely well because it has become one of America's most valued documents!

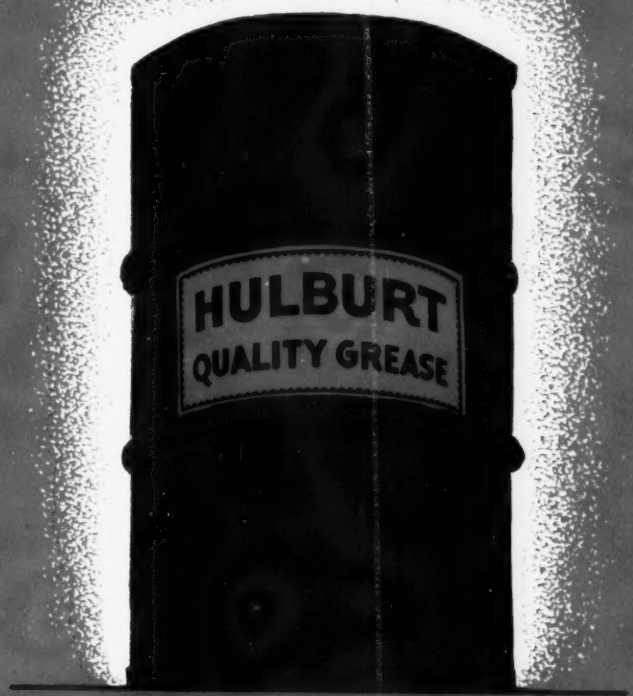
Coal Mine Lubrication—for a quarter of a century—has been helped by Hulburt of Philadelphia. And just as the early lawmakers turned to Jefferson, so the coal industry turns to Hulburt. In Hulburt's plant, engineers specialize in lubricating grease and have perfected a *Quality* grease that is the tested result of thorough research. This specialized Engineering Service gives you *better* grease of Quality.

Tech.

HULBURT OIL & GREASE COMPANY ... PHILADELPHIA, PENNA.

Specialists in Coal Mine Lubrication

SUPREMELY WELL



HULBURT *Quality* GREASE

Coal Age

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A McGRAW-HILL PUBLICATION

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CHANGE OF ADDRESS

Director of Circulation, COAL AGE,
330 West 42nd St., New York 18, N. Y.

Please change the address of my COAL AGE subscription as follows:

Name .....

Old Address .....

New Address .....

New Company Connection .....

New Title or Position .....

LIKE A TOP-FLIGHT GOLFER

FORM-SET ROPE IS *Relaxed*

When the champion rifles his drive down the fairway, the gallery murmurs admiringly, "Doesn't he make it look easy!" And, for him, it *is* easy. Timing perfect, swing perfect. The secret is *relaxation.*

Much of that same relaxed effect is present in Form-Set rope. Form-Set is Bethlehem's preformed rope, and it spools easily, handles easily—every last foot of it. The reason, of course, is that a preformed wire rope has been relieved of many internal stresses; it's limber, bendable, supple. It doesn't require extensive breaking-in.

Well, you ask, what do I get besides this easy handling? Anything else?

Plenty—when it's a Form-Set rope. With stresses, strains, and tension reduced, a rope has high resistance to bending fatigue—and that means longer life, fewer replacements.

Sounds pretty logical, doesn't it? See for yourself with a reel of *relaxed* Form-Set*.

**All grades of Bethlehem wire rope are available in the Form-Set construction.*

When you think WIRE ROPE . . . think BETHLEHEM

Today, approximately three-fourths of all rectifiers in the mining industry are of the portable type . . . and of all existing installations, *more than two-thirds are Westinghouse Ignitron units.* And there are good reasons for this leadership.

The Westinghouse Ignitron Rectifier Equipment is *safe* underground. With its air-cooled transformer and "De-ion" air circuit breaker, no inflammable or explosive cooling liquids are required. Transformer fire and explosion hazards are eliminated.

Mounted on mine car wheels, the Westinghouse Portable Ignitron train is a complete self-contained power substation . . . ready for use wherever mine track is laid. Its light weight permits it to be easily moved to new locations . . . move it in . . . connect it to the power source . . . and it's ready to work.

Westinghouse Ignitron Equipment performs all types of heavy-duty service . . . in coal, iron, zinc, copper and salt mines. In some cases, the complete d-c power requirements of the mine are supplied by Ignitrons. Without exception, Westinghouse Ignitron installations are successful installations . . . as evidenced by the many repeat orders. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

J-94669

Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

WESTINGHOUSE IGNITRON EQUIPMENT

ONLY WESTINGHOUSE OFFERS THE ASL AIR-COOLED TRANSFORMER

The use of ASL air-cooled transformers for portable rectifier service *is an exclusive Westinghouse feature*. No other manufacturer offers this outstanding development.

The Westinghouse type ASL air-cooled transformer is an important factor in the safe, reliable operation of the Ignitron Rectifier equipment. The transformer itself is thoroughly insulated with a fireproof inorganic material. Dust, dirt, fumes, heat, dampness or condensation have no effect on the operation of the air-cooled transformer.

PORTABLE IGNITRON EQUIPMENT

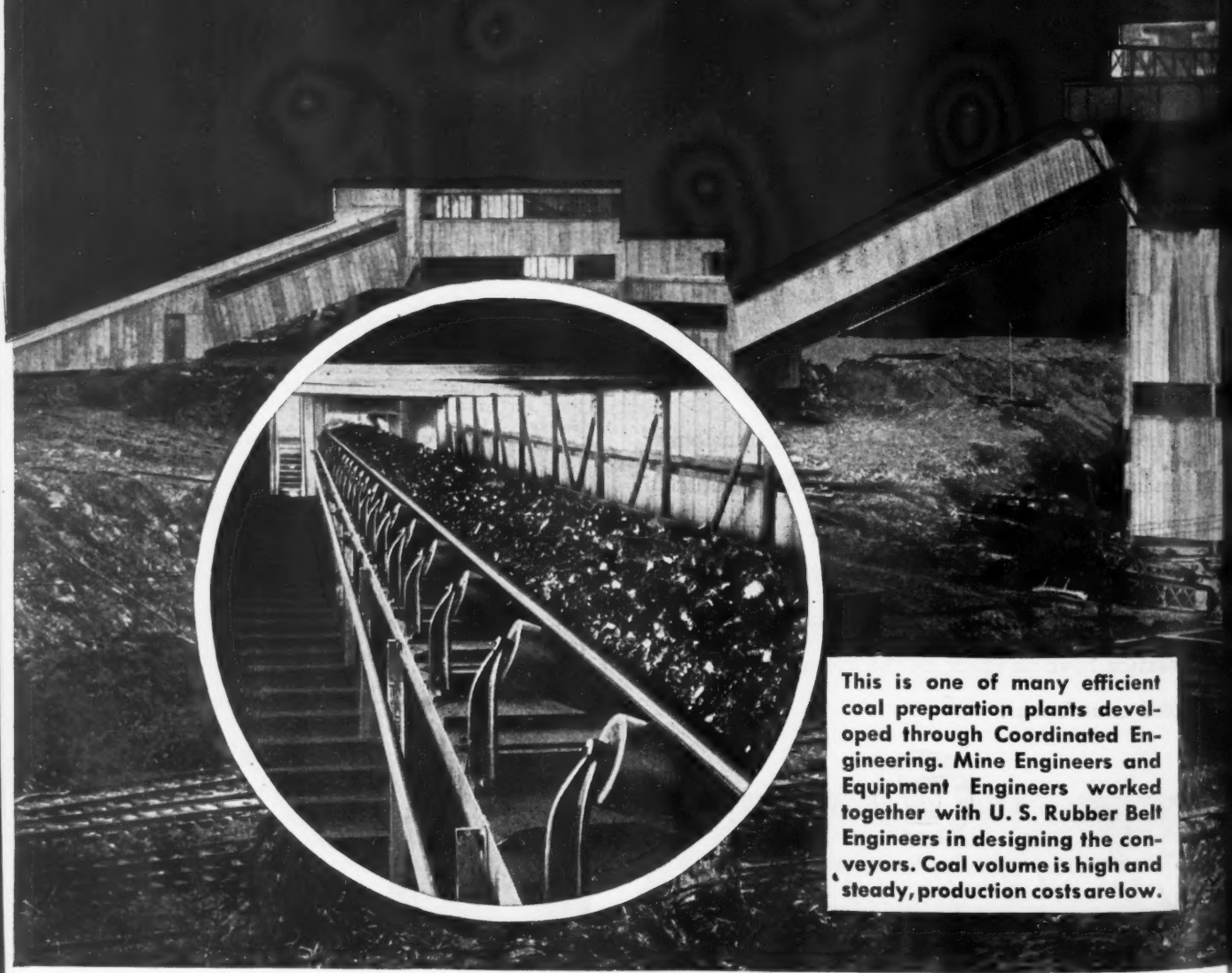
WESTINGHOUSE IGNITRON GIVES THESE ADVANTAGES OVER CONVENTIONAL ROTATING EQUIPMENT

1. *High efficiency at all loads*—less kilowatthours loss, and lower maximum demand.
2. *Capacity for frequently repeated severe overloads*—high load swings are handled easily—an important factor in mining service.
3. *Reliability*—less lost time and increased production.
4. *Ease of installation*—unit is completely self-contained, requiring only connections to the power source and the load.
5. *Lightweight*—easily moved to new locations.
6. *Reduced maintenance*—no large rotating parts; no large bearings, commutators or slip rings to replace or maintain.
7. *No surge or high inrush during starting.*
8. *Quiet operation.*
9. *Reduced fire hazard.*
10. *No danger from overspeeding.*

SEND FOR THIS BOOKLET

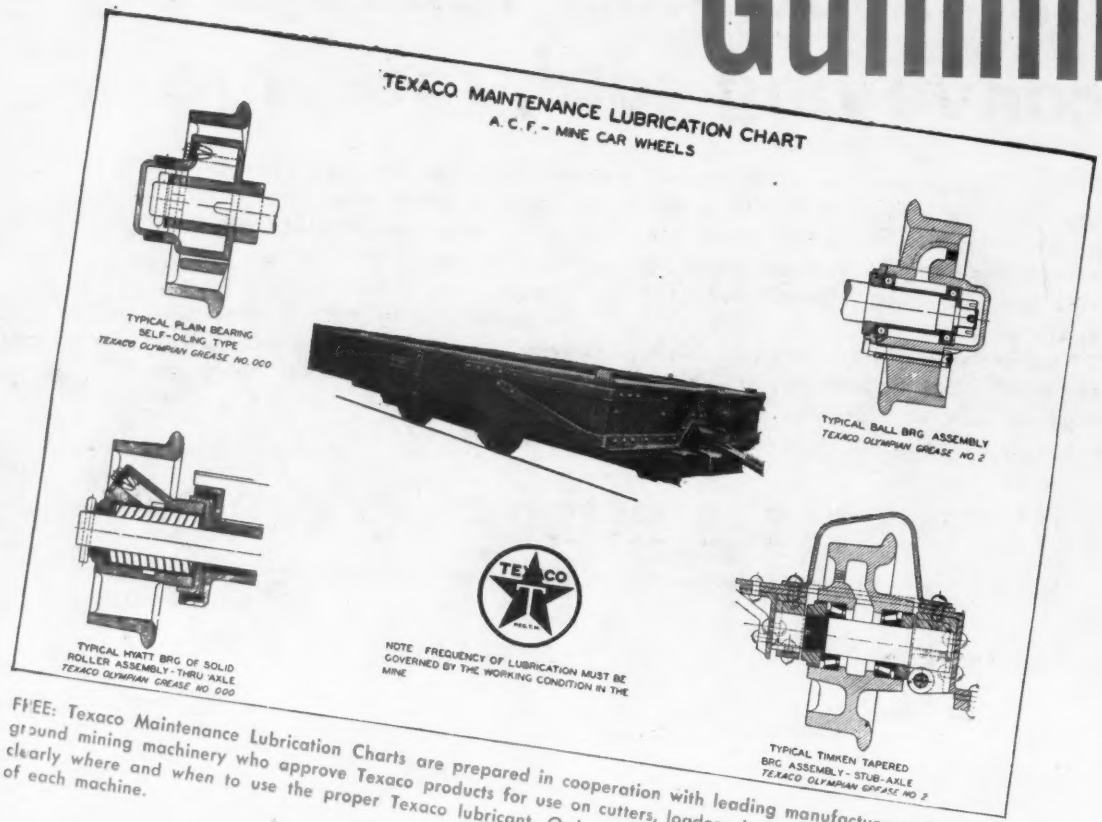
This new booklet gives complete details about the Westinghouse Portable Ignitron Rectifier. It contains specifications of the four standard sizes now being built—200, 300, 400 and 500 kw. Write for your copy of B-3492 today. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

COORDINATED ENGINEERING *Gets Results!*



This is one of many efficient coal preparation plants developed through Coordinated Engineering. Mine Engineers and Equipment Engineers worked together with U. S. Rubber Belt Engineers in designing the conveyors. Coal volume is high and steady, production costs are low.

"Gunning"



FREE: Texaco Maintenance Lubrication Charts are prepared in cooperation with leading manufacturers of underground mining machinery who approve Texaco products for use on cutters, loaders, locomotives, etc. Charts show clearly where and when to use the proper Texaco lubricant. Order the Charts you need by make and model of each machine.

for Higher Tonnage

THE man-with-the-grease-gun plays a big part in maintaining tonnage. Effective lubrication of mine machinery is the most important single factor in assuring the uninterrupted operation necessary to meet today's higher tonnage demands.

Mine cars, in particular, must operate freely in spite of overloading, water, dirt, extremes of temperature, and other adverse conditions. Above or below ground, mine transportation needs Texaco 4-R Lubrication —

Right lubricant
Right amount
Right time
Right place

assured by Texaco lubricants and Texaco Engineering Service.

Texaco Olympian Grease, for example, is ideal for mine car wheels under all temperature conditions. It assures easier starting, longer-lasting bearings, less need for repairs. Application and gun refilling are easy. Olympian is equally effective for cutters, loaders and other equipment.

Texaco Lubrication Engineering Service is available through more than 2300 Texaco distributing plants in the 48 States. Get in touch with the nearest one, or write The Texas Company, *National Sales Division, Dept. C.,* 135 E. 42nd St., New York 17, N. Y.

TEXACO

REG. T. M.

TEXACO
Lubricants

FOR THE
COAL MINING INDUSTRY

Wire Rope Value Begins With Wire

ROPE REMINDERS

Regular inspection of wire rope is necessary for operating efficiency.

And proper rope inspection means, first, examining its entire length to find the most worn or deteriorated spot.

Check the number of broken wires in the worst rope lay—and the rope's diameter at that point. See how much abrasion has occurred on the wires.

Look in the valleys between the strands for rust and pitting. Note carefully, too, the condition of the rope near attached fittings.

If wire breaks have occurred prematurely, check the installations carefully to locate possible causes.

A detailed study made by a Roebling engineer will show whether a more suitable rope is the answer . . . or whether improvements should be made on the installation.

WHAT DETERMINES THE PERFORMANCE you get from wire rope? It's the handling it gets—the equipment it works on—the job to be done.

All these count. But what counts *most* is the rope itself. And that's the reason why you should rig your shovels, draglines and scrapers with Roebling "Blue Center" Rope.

For "Blue Center" gives you dependable performance—even under severe and abusive conditions. It's rope quality that begins with wires drawn from finest steel . . . Roebling-made!

To get *best* results from "Blue Center" select the right rope . . . and use it right. Roebling engineers will be glad to show you how. Call or write our nearest branch office.

JOHN A. ROEBLING'S SONS COMPANY
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ROE

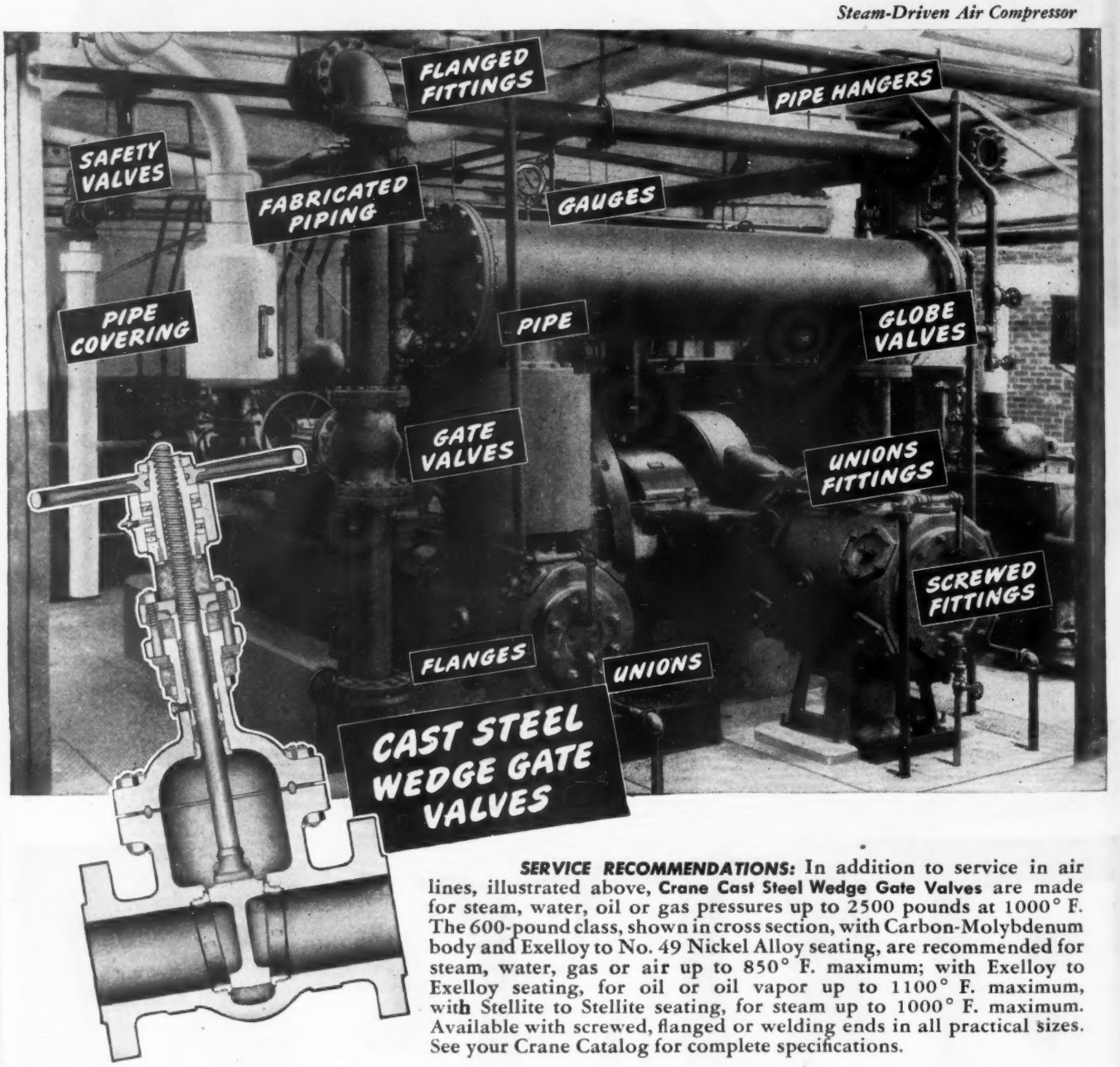
PACEMAKER IN

Wherever You Need Piping Materials ...RELY ON CRANE

ONE SOURCE OF SUPPLY • ONE RESPONSIBILITY • ONE STANDARD OF QUALITY

Supplying everything necessary for any piping system is the job of your Crane Branch or Wholesaler. This single source offers the world's greatest selection of piping materials—in brass, iron and steel. Uniform quality in all materials—backed by single responsibility—helps assure the best installation. By using Crane *complete* piping materials service, you speed deferred replacements—keep piping performance at its best. Below is an example of the completeness of the Crane line—in Cast Steel Wedge Gate Valves.

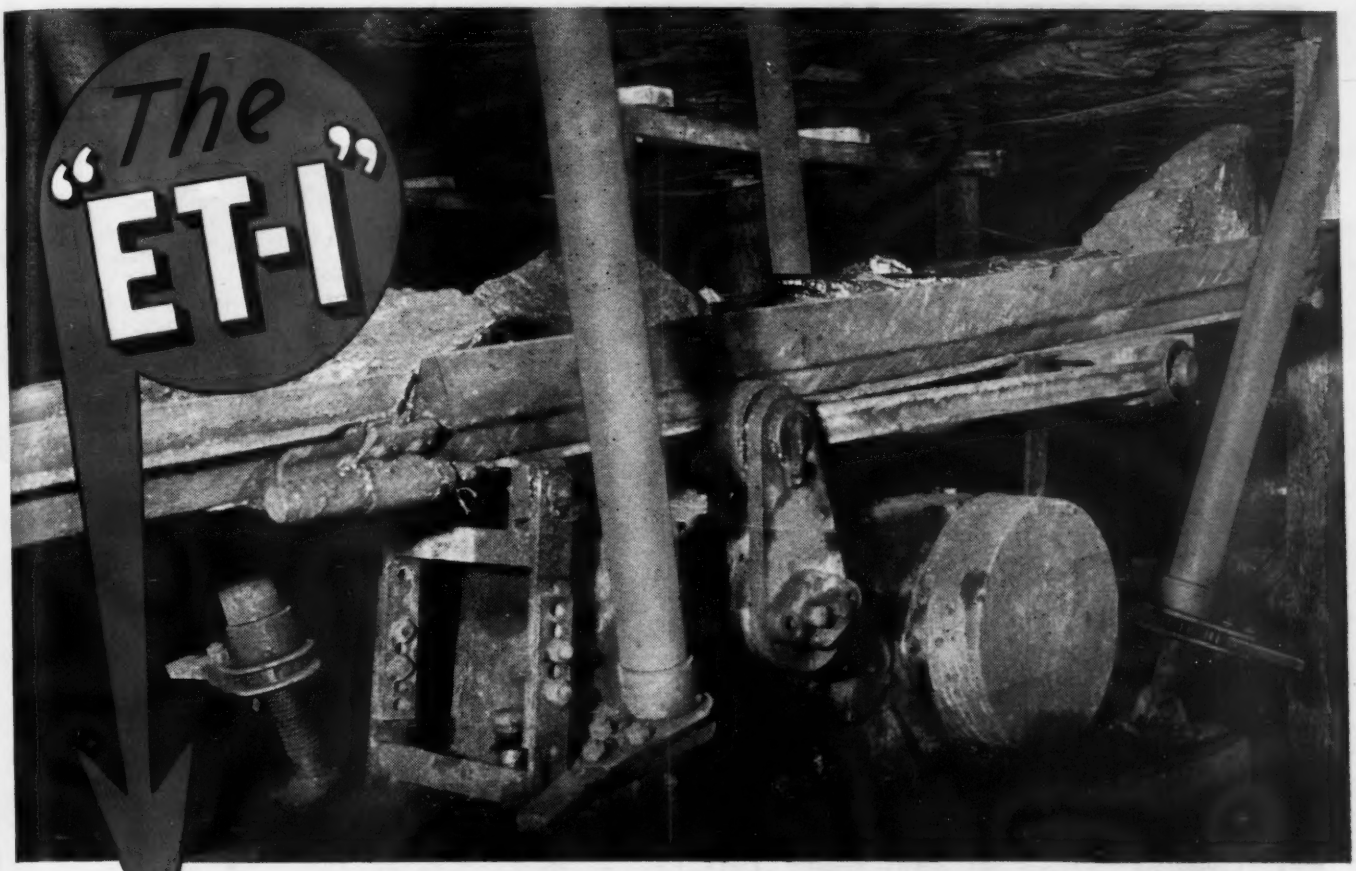
Steam-Driven Air Compressor



SERVICE RECOMMENDATIONS: In addition to service in air lines, illustrated above, **Crane Cast Steel Wedge Gate Valves** are made for steam, water, oil or gas pressures up to 2500 pounds at 1000° F. The 600-pound class, shown in cross section, with Carbon-Molybdenum body and Exelloy to No. 49 Nickel Alloy seating, are recommended for steam, water, gas or air up to 850° F. maximum; with Exelloy to Exelloy seating, for oil or oil vapor up to 1100° F. maximum, with Stellite to Stellite seating, for steam up to 1000° F. maximum. Available with screwed, flanged or welding ends in all practical sizes. See your Crane Catalog for complete specifications.

CRANE CO., General Offices: 836 S. Michigan Ave., Chicago 5, Ill. • *Branches and Wholesalers Serving All Industrial Areas*

CRANE — 90 YEARS OF PROGRESS 1855 1945 — **VALVES • FITTINGS • PIPE**
PLUMBING • HEATING • PUMPS



. . . . A Vulcan Shaking-Conveyor Drive with

EXTRA STRENGTH AND POWER

All Vulcan shaking-conveyor drives are tough and sturdy but the ET-1 was designed especially for jobs that require extra strength and power — and has thoroughly proved its money-saving superiority for a wide range of heavy-duty service.

Built like a battleship; with oversize heat-treated alloy-steel gears and shafts mounted on anti-friction bearings in an oil-tight cast-steel housing, it drives several hundred feet of heavily-loaded chute for long periods of time without need for any other attention than occasional lubrication. When necessary, it can be used successfully on adverse grades, as shown in the illustration above.

Write us regarding any coal or rock-handling requirement. We not only manufacture a widely-used and highly-developed line of Shaking-Chute Conveyors but also an equally complete and service-proved line of Underground Chain Conveyors, so that our experienced engineers can afford to be absolutely impartial in their recommendations. Bulletins containing complete working data mailed promptly on request.

VULCAN IRON WORKS

Established 1849

Main Office and Works **WILKES-BARRE, PA.,** New York Office 50 Church

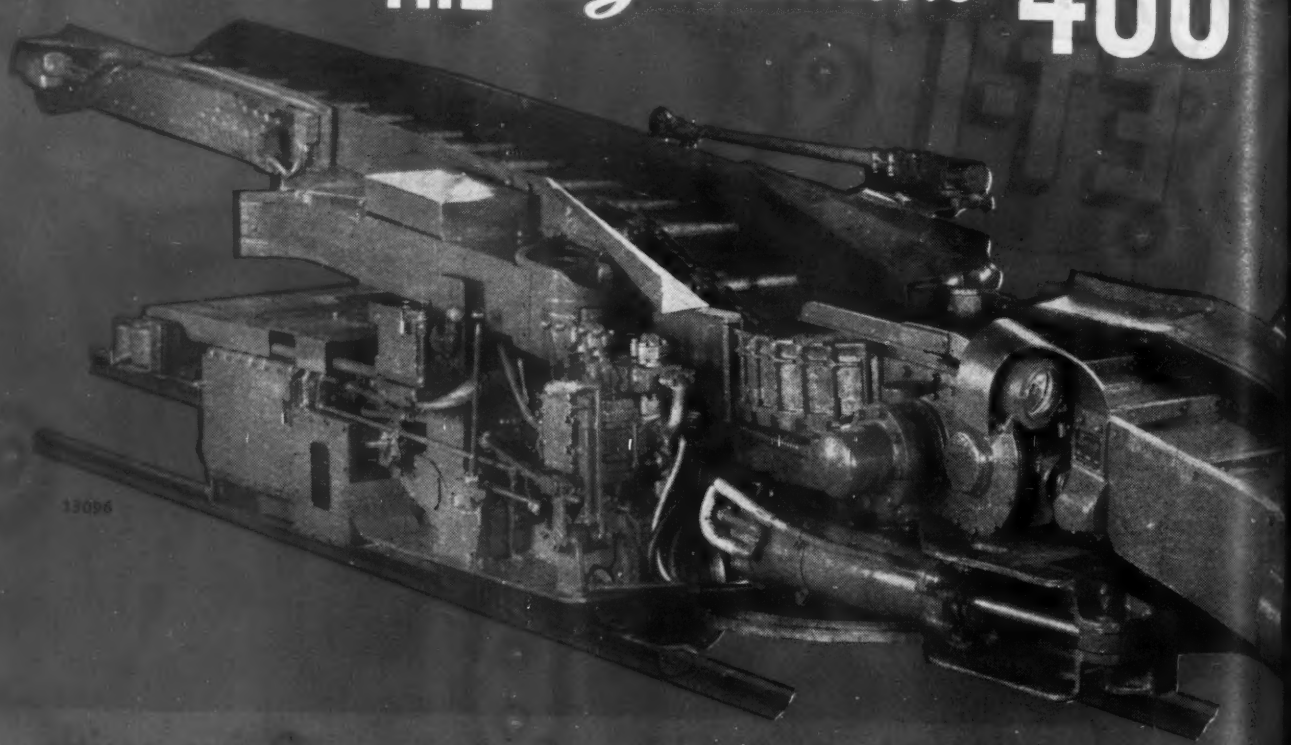
Heavy-Duty Electric Hoists
Self-Contained Hoists
Scraper Hoists
Car-Spotting Hoists
Room Hoists

Shaking-Chute Conveyors
Chain Conveyors
Cast-Steel Sheaves and Gears
Cages, Skips and Gunboats
Coal-Preparation Equipment

Steam Locomotives
Diesel Locomotives
geared and electric drive
Gasoline Locomotives
geared and electric drive

Load-Carrying Larries
Rotary Kilns, Coolers and Dryers
Crushing Rolls and Pulverizers
Briquetting Machines
Ball, Rod and Tube Mills

THE *Goodman* 460



13096

Maneuverability, ease of operation and low maintenance cost are features.

12804

Goodman MANUFACTURING CO

SETS THE PACE FOR EVERY SHIFT

From face to mine car, coal is moved on a profitable time and tonnage schedule. A thorough job of loading is accomplished from straight track or on sharp curves.

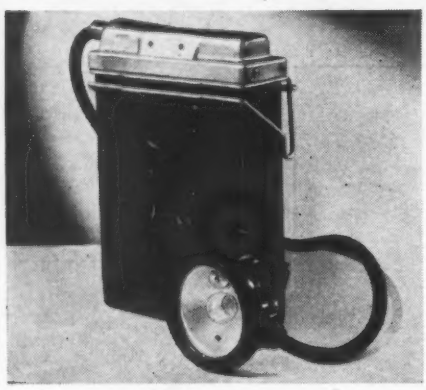
11831

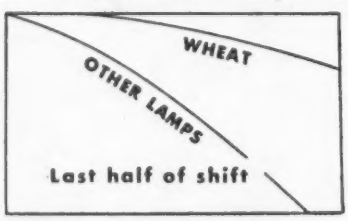
NG COMPANY • Halsted Street at 48th • Chicago 9, Illinois

Tim Malloy *says...*

The Wheat lamp suits me because it is safer. Boy, what a relief to know there is nothing in the Wheat Lamp to injure a healthy body.

WHEN YOU USE **WHEAT** YOU USE THE SAFEST





Wheat burn brighter at end of shift

1. It is SAFE — Two bulbs — if one is broken, miner is never in the dark. Rubber battery case — non-conductor of electricity. Battery solution harmless to a healthy skin.
2. It is DEPENDABLE — The Koehler Manufacturing Company and Wheat Lamp Sales, Inc. are one company who for over thirty years have had a single purpose — Better Mine Lighting.
3. It is EFFICIENT — The Koehler Manufacturing Company has devoted its laboratory and research department exclusively to perfect a lamp which remains bright at the end of the shift.
4. It is ECONOMICAL — Wheat's exclusive feature of Self Service saves the operator thousands of dollars annually by reducing mine operating costs.

Write today—

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KOEHLER MFG. CO.
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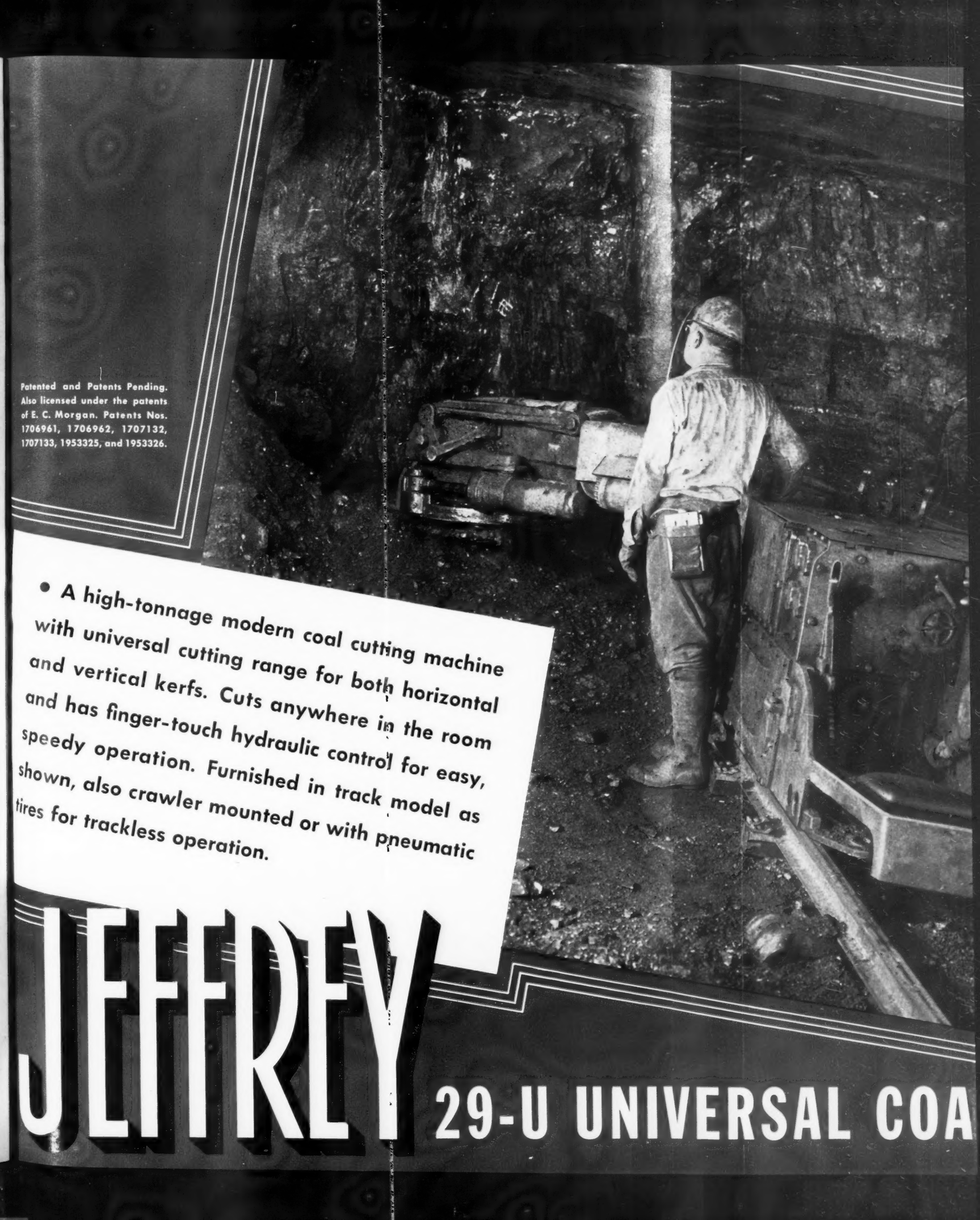
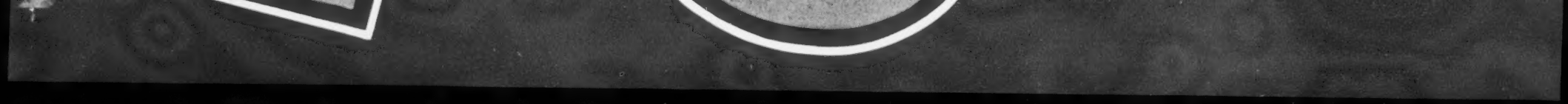


Patented and Patents Pending. Also licensed under the patents of E. C. Morgan. Patents Nos. 1706961, 1706962, 1707132, 1707133, 1953325, and 1953326.

• A high-tonnage modern coal cutting machine with universal cutting range for both horizontal and vertical kerfs. Cuts anywhere in the room and has finger-touch hydraulic control for easy, speedy operation. Furnished in track model as shown, also crawler mounted or with pneumatic tires for trackless operation.

JEFFREY 29-U UNIVERSAL COA

RSAL COAL CUTTER



PUBLIC UTILITIES

Consume Approximately

163 MILLION TONS OF COAL ANNUALLY

JEFFREY has a stake in this production by means of the vast amount of equipment used to produce this coal at costs which make it an economical fuel . . . drills, cutters, loaders, mine conveyors, fans, locomotives, and allied units.

THE TRUCK WITH THE BATTLEFRONT BACKGROUND

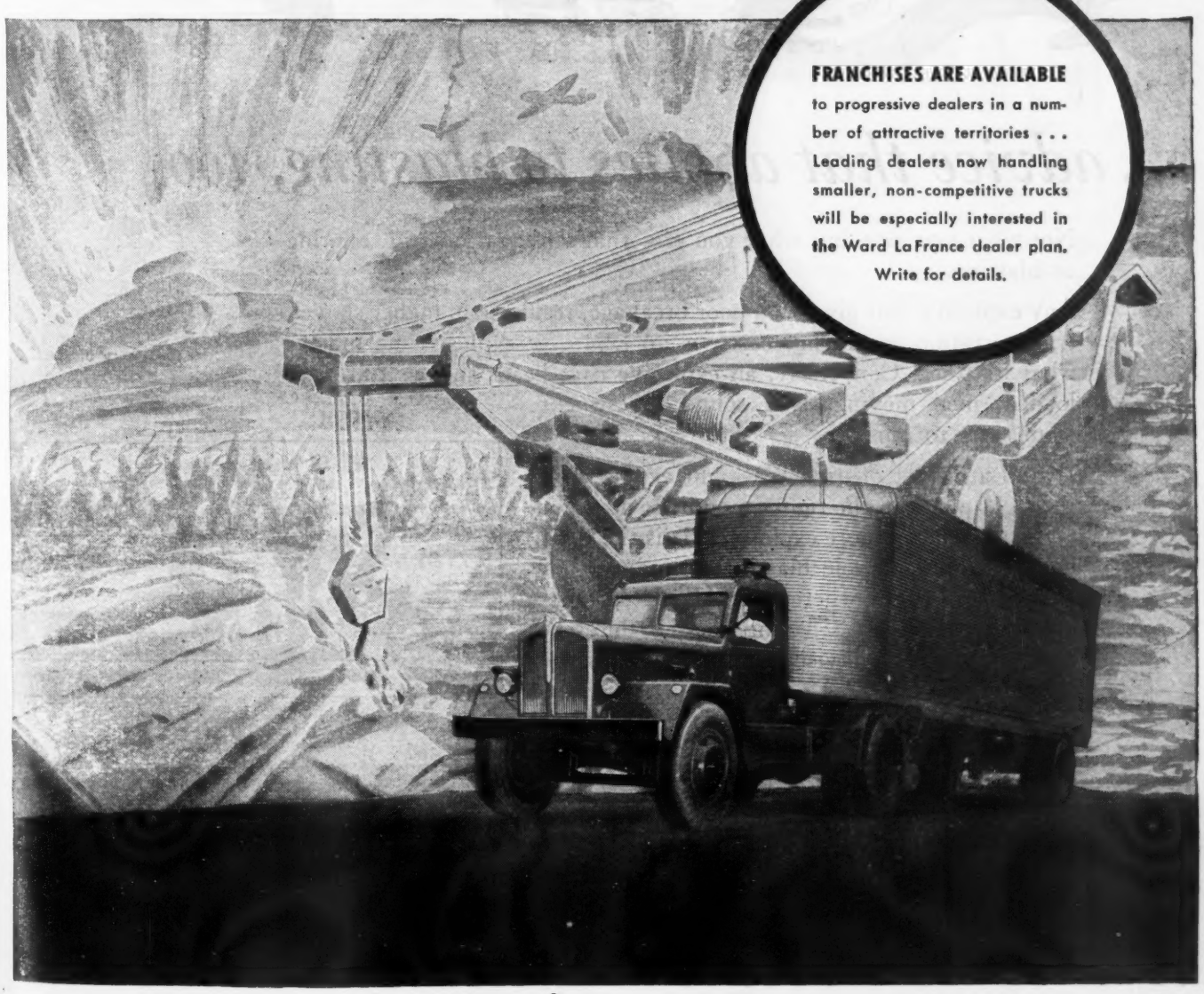
● One of the battlefront jobs of the Ward LaFrance Heavy Wrecker, M1A1, is to move in under the very nose of the enemy and remove damaged tanks and other vehicles to a repair base where they can be put in fighting condition again. The M1A1 has performed amazing feats, under the worst possible operating conditions, on all major fronts, where human life depends on *performance*.

Building such good trucks is not new to Ward LaFrance, but our new commercial models, inspired by the outstanding record of this 6x6 Ordnance vehicle, are by far the best trucks we have ever manufactured. Like the M1A1 they are big and tough with pay load capacity ranging up to 30 tons. They're the trucks with the "battlefront background"... designed, engineered, and manufactured for low-cost hauling. Now available to essential users. See your local Ward LaFrance dealer. If there is no dealer in your locality, write direct.

WARD LAFRANCE

TRUCK DIVISION

GREAT AMERICAN INDUSTRIES, INC. • ELMIRA, NEW YORK



FRANCHISES ARE AVAILABLE to progressive dealers in a number of attractive territories . . . Leading dealers now handling smaller, non-competitive trucks will be especially interested in the Ward LaFrance dealer plan. Write for details.

"True Saving Is a Matter of Right Selection"

. . . *advice that applies to blasting, too*

Not what you *save*, but what you *get*—that's what counts in tailoring or blasting.

Any explosive that gives you poor breakage, resulting in higher shovel, transportation or crusher costs, is an *expensive* explosive no matter what its price. Conversely, an explosive that keeps shovels full, cars loaded, men moving, is a sound investment from start to finish.

It's all a matter of using the right explosive in the right place, in the right amount. It does not necessarily mean more explosives. It is the right handling of the whole blasting procedure that counts. And that's where your Atlas Representative can help you—selecting from 120 different grades and kinds, advising on methods for the best results.

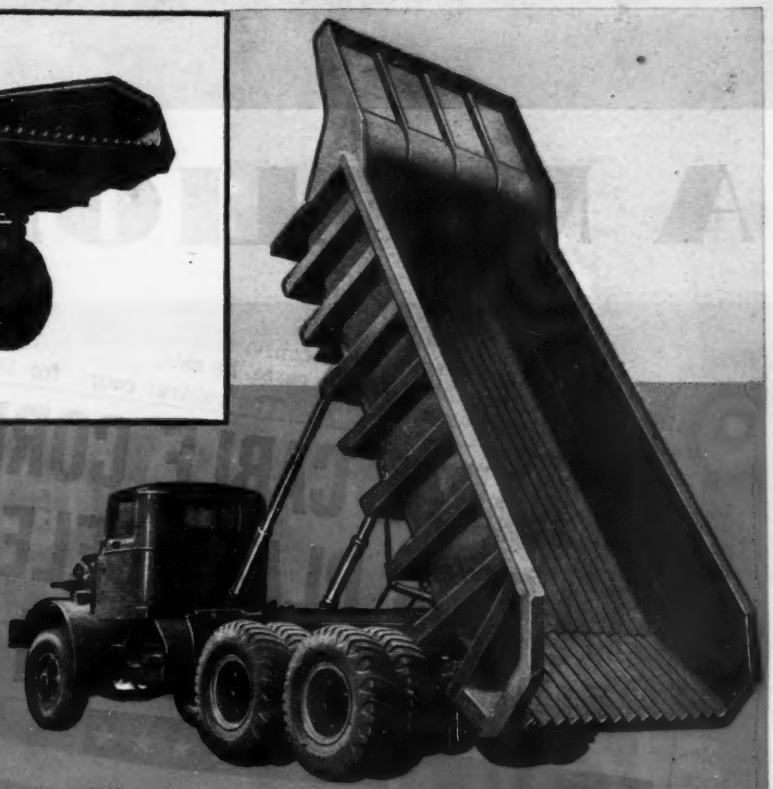
Good Blasting Makes Money—Poor Blasting Loses Money

ATLAS EXPLOSIVES
"Everything for Blasting"

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington 99, Del. • *Offices in principal cities* • *Cable Address—Atpowco*

Body with open or scoop end (Right) Same body elevated.



X-112 BODIES *and* T-4440 HOISTS *for* OPEN PIT MINING

Body with automatic downfold tailgate.

Fleets of Trucks, equipped with Gar Wood X-112 Bodies and T-4440 Hydraulic Hoists, are hauling the biggest loads ever moved by trucks on production schedules. Lower mining costs have been made possible by speeding up the handling of overburden and coal.

BUY MORE BONDS AND KEEP 'EM

SPECIFICATIONS

HOIST—Hydraulic, twin cylinder, telescopic.

PUMP—Gear type with aluminum wearplates.

POWER-TAKEOFF—2-gear single speed.

BODY—Heavy duty with pressed-steel, box-type side braces and cross members.

BODY SHELL—¼" sheet steel with 2" wood filler.

WEARPLATE—¼" with floor angles or $\frac{5}{16}$" without. Longitudinals 8-inch "H" beams.

CAB SHIELD—¼" plate.

FLOOR ANGLES—Optional.

Automatic gate opens as body elevates.

GAR WOOD INDUSTRIES, Inc., Detroit 11, Michigan

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

WORLD'S LARGEST MANUFACTURERS OF TRUCK AND TRAILER EQUIPMENT

A MILLION MILES

GENERAL CABLE CORPORATION'S ST. LOUIS PLANT CELEBRATES RECORD WIRE PRODUCTION ACHIEVEMENT

The MILLIONTH Mile of Field Wire

More than twenty months of inspired war effort on the part of the Men and Women Employees of the St. Louis Plant of General Cable Corporation were crowned today with gratifying success when the millionth mile of critical field communication wire, single conductor, rolled off the production line ready for shipment to our armed forces overseas.

This notable General Cable achievement, one of the most significant accomplishments in the production of a vital war material to be achieved in the St. Louis area and unequalled in performance in any communication wire plant in the world, marks an epochal milepost in the production of field wire which began in the local plant in October, 1943.

More than four thousand employees working on an average of fifty-two hours per week in three shifts, seven days, are engaged in meeting the urgent requirements for field wire of the United States and its allies. Current production is running in excess of four thousand miles per day or, putting it another way, approximately five times around the globe once a month.

In commenting on the production feat of the local organization, Mr. Dwight R. G. Palmer, President of General Cable Corporation stated, 'Though the performance of our St. Louis Plant was accomplished in the ordinary line of duty, Management nevertheless is particularly gratified that its personnel, comprising all races, creeds and colors, harmoniously evidenced their patriotic sincerity by establishing this outstanding record. We salute the Men and Women of our St. Louis Plant for this production achievement'.

OF FIELD WIRE...

Just one example of General Cable's Service to the Nation and its Allies

This output of *one million miles of single conductor communication wire* for the armed services represents the *all-out* effort at only one plant producing enough wire to encircle the globe five times each month.

All ten General Cable plants have been working three shifts, seven days per week, on this and other essential military items.

Come final Victory, General Cable will as energetically attempt to do its part in winning the peace.

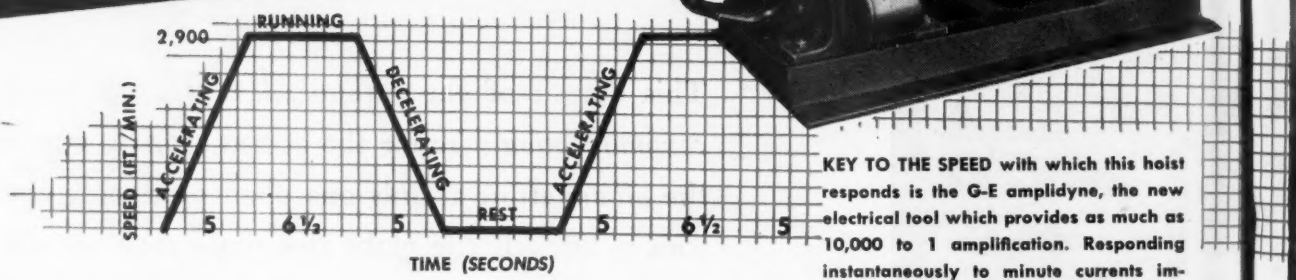
GENERAL CABLE CORPORATION

Manufacturers of Bare and Insulated Wires and Cables for Every Electrical Purpose

NEW AMPLIDYNE-CONTROLLED MINE HOIST

makes 167 trips PER HOUR

HOISTS 750 TONS OF COAL PER HOUR UP 487-FOOT SHAFT

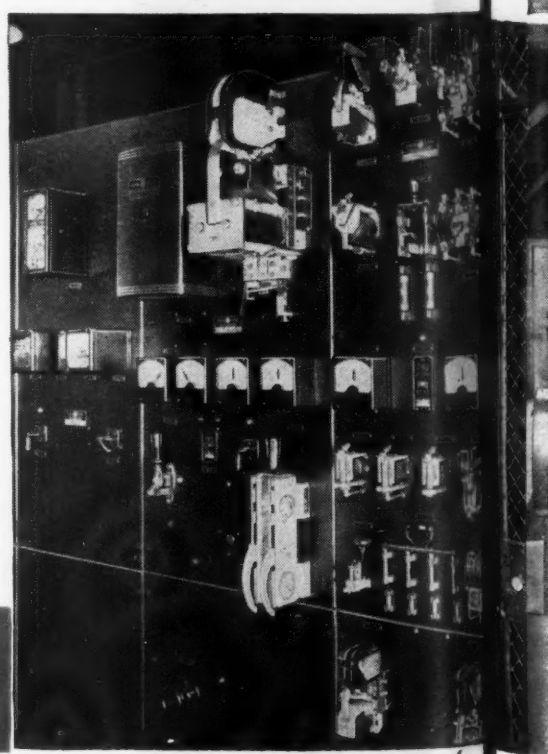


KEY TO THE SPEED with which this hoist responds is the G-E amplidyne, the new electrical tool which provides as much as 10,000 to 1 amplification. Responding instantaneously to minute currents impressed on its control field, the amplidyne furnishes the power to drive or control machines.

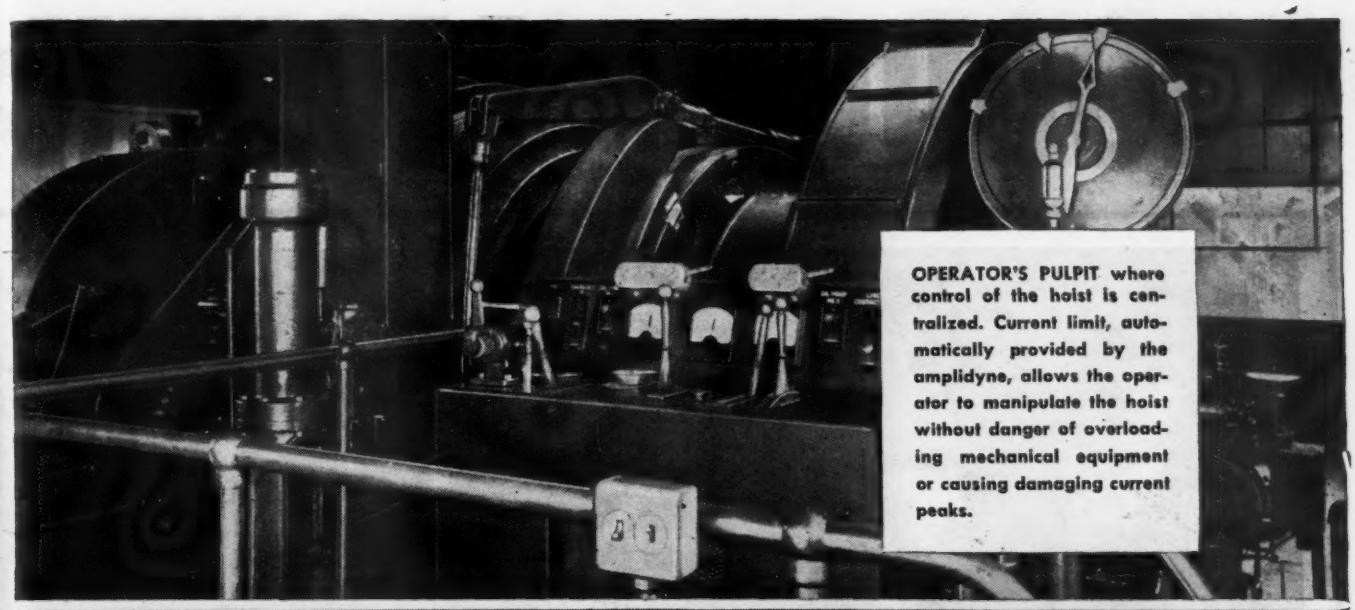
MINE cars don't pile up waiting for the hoist in the Pennsylvania mine where this new G-E drive is installed. Hoisting 4½-ton loads 487 feet in the almost unbelievable time of 16½ seconds, this hoist is making a truly remarkable record for tonnage handled.

As the chart above shows, the amplidyne-controlled drive accelerates the fully loaded cage to running speed in 5 seconds, and decelerates it to a stop in the same time. In addition, the maximum running speed is 2900 feet per minute, which necessitates accurate and positive control. A complete trip is made every 21½ seconds: 10 to accelerate and decelerate; 6½ running at full speed; and 5 to dump and load. In continuous operation, the hoist thus makes 167 trips per hour; handles 750 tons of coal per hour.

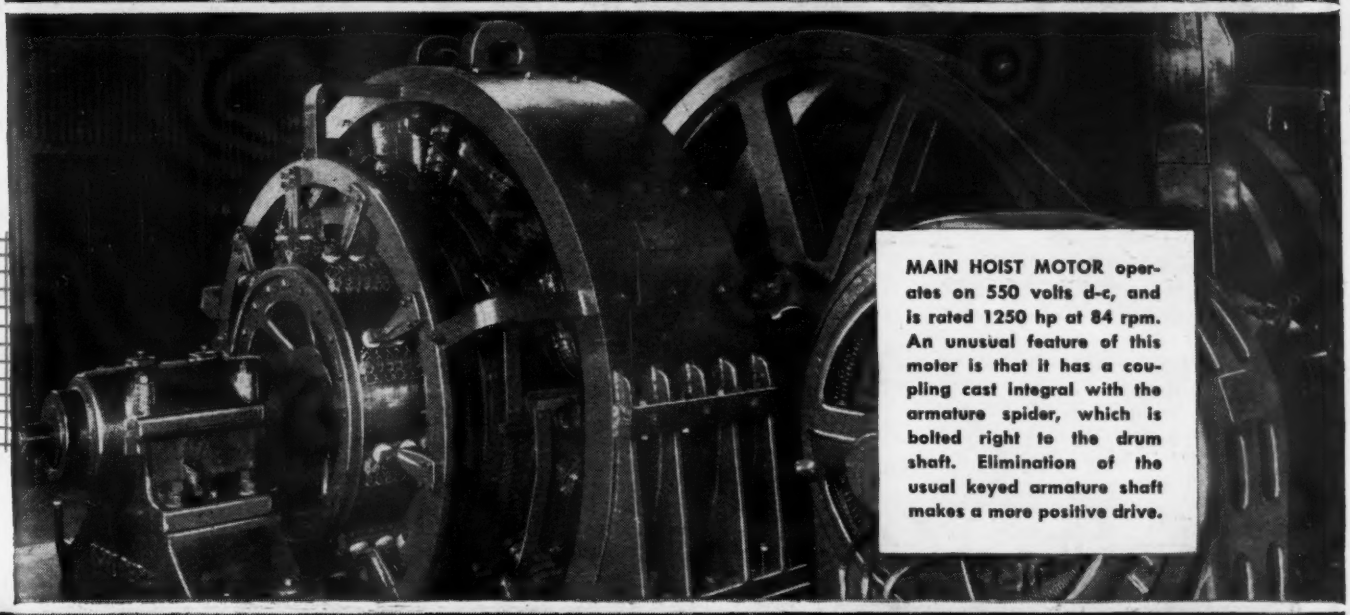
If you are planning to install a new hoist, or to modernize one of your present drives, let G-E engineers give you the benefit of their practical experience with hoists of every type and size. The teamwork of amplidyne control and G-E hoist motors will give you the hoist you need to handle the tonnage you want —rapidly and safely. *General Electric Co., Schenectady 5, New York.*



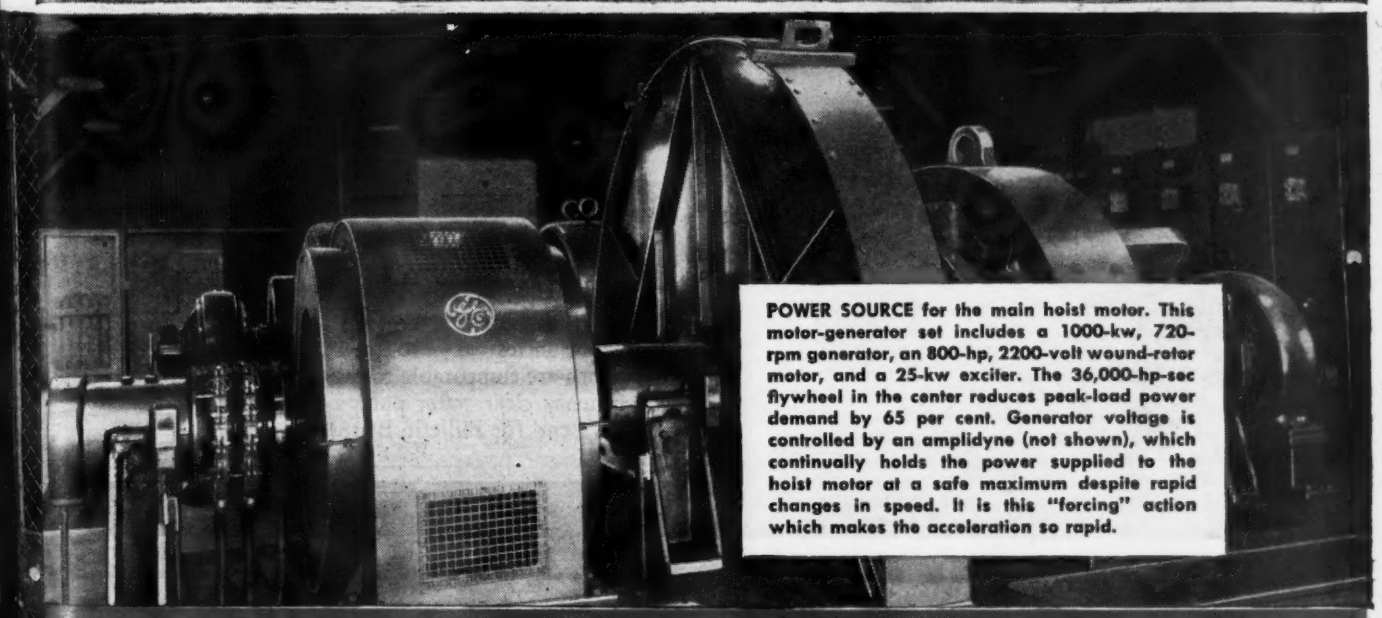
SIMPLICITY OF CONTROL is a big feature of the G-E amplidyne. Contrast the small size and small number of the devices on the amplidyne panel (right) with the many contactors and relays that would be required with conventional control. Left-hand panel controls the dynamic-braking exciter for the motor-generator. Center panel is the main d-c line panel.



OPERATOR'S PULPIT where control of the hoist is centralized. Current limit, automatically provided by the amplidyne, allows the operator to manipulate the hoist without danger of overloading mechanical equipment or causing damaging current peaks.



MAIN HOIST MOTOR operates on 550 volts d-c, and is rated 1250 hp at 84 rpm. An unusual feature of this motor is that it has a coupling cast integral with the armature spider, which is bolted right to the drum shaft. Elimination of the usual keyed armature shaft makes a more positive drive.



POWER SOURCE for the main hoist motor. This motor-generator set includes a 1000-kw, 720-rpm generator, an 800-hp, 2200-volt wound-rotor motor, and a 25-kw exciter. The 36,000-hp-sec flywheel in the center reduces peak-load power demand by 65 per cent. Generator voltage is controlled by an amplidyne (not shown), which continually holds the power supplied to the hoist motor at a safe maximum despite rapid changes in speed. It is this "forcing" action which makes the acceleration so rapid.

GENERAL ELECTRIC

PRODUCT OF THE MONTH:

NEW SOLIDS-HANDLING PUMP, size 10 inch by 8 inch, rated at 3000 gpm, 70 ft head, is handling 17 to 20% solids in an Indiana coal plant. The unit is pumping return jig water to a settling cone overhead.

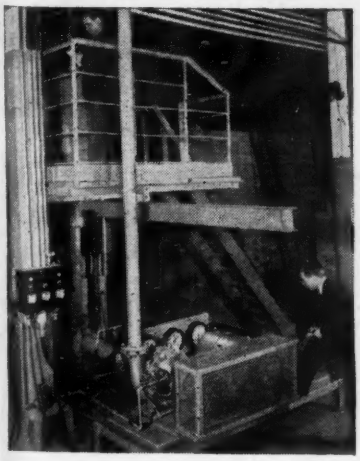
Efficiencies of the new Solids-Handling Pumps are comparable to those of ordinary high efficiency clear water pumps. For complete details, send for Bulletin B6381.

ALLIS CHALMERS

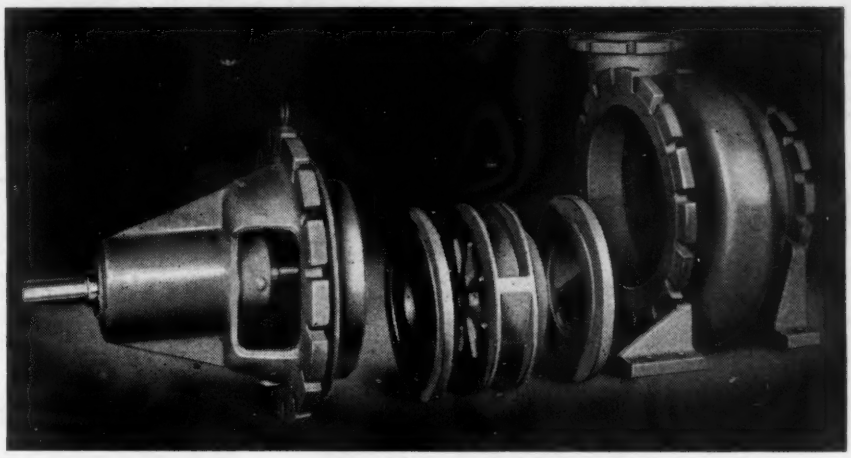
NEW A-C SOLIDS-HANDLING PUMP

MILWAUKEE, WIS. — Allis-Chalmers announces a new pump, designed for solids-handling, water recirculation and sludge disposal in coal preparation plants.

The new pump promises a lower cost per ton of solids handled than conventional units of this type. Main reasons are: 1) Low initial cost — sells for about same price as ordinary high efficiency water pumps; 2) Longer parts life — average is 2 to 4 times that of ordinary materials; 3) Low maintenance — has fewer parts than comparable pumps; 4) Low operating cost — in one case, customer is saving $10 per day in power alone. Eight sizes to handle through 7000 gallons per minute. Send for B6381.



THE NEW PUMP is constructed of a tough, highly-abrasive-resistant alloy developed by A-C. Laboratory and field tests show that this alloy plus special pump design *increases* pump life *2 to 4 times* over ordinary construction.



EXPLODED VIEW of the new Solids-Handling Pump illustrates its simplified design, quick accessibility of parts. Entire rotating element can be removed without disturbing suction or discharge piping.

The new Solids-Handling Pump has fewer parts than comparable pumps That means fewer replacement parts for operators to handle, a lower parts inventory. Allis-Chalmers maintains stocks of complete units as well as expendable replacement parts in principal coal areas.

MILWAUKEE, WIS.

Use the Haulage BATTERY with these Cost-Cutting Advantages

These inherent construction and operating advantages are principal reasons why Edison Alkaline Batteries provide the closest approach to failure-free uninterrupted haulage power it is possible to obtain; give longer service life than other types of batteries; are so simple to maintain, and consequently, so economical to use. Because of their unequaled dependability and long, trouble-free life, alkaline batteries are helping users to keep down haulage costs. *Edison Storage Battery Division of Thomas A. Edison, Incorporated, West Orange, N. J.*

In Mine Locomotives and Shuttle Cars, Edison Alkaline Batteries Give You These Important Advantages:

- They are **durable mechanically;** grids, containers and other structural parts of the cells are of steel; the alkaline electrolyte is a preservative of steel.
- They are **foolproof electrically;** are not injured by short circuiting, reverse charging or similar accidents; are free from self-deteriorating reactions.
- They are **simple and easy to maintain.**
- They can be **charged rapidly;** do not require critical adjustment of charge rates; can be charged directly from mine d-c supply.
- They **withstand temperature extremes;** are free from freezing hazard; are easily ventilated for rapid cooling.
- They can **stand idle indefinitely** without injury, without attention, and without expense.

Edison

ALKALINE BATTERIES

little wires with BIG JOBS

Lamp failure for any one of these men far inside the mine means interruption to work. A dependable lamp cord is important in preventing this unnecessary loss of time. Not only can Hazard Miners' Lamp Cord be depended upon for safe, uninterrupted service — its light weight and flexibility bring greater comfort and efficiency to men who must stoop and bend.

The flexibility of Hazard Miners' Lamp Cord results from careful construction with high grade, pliable materials. Each conductor, consisting of many fine, stranded copper wires, is coated with flexible rubber insulation and both of them are twisted with a short lay around a center cord for super-flexibility and strength. The mold-cured outer jacket of tough oil and grease resistant Hazaprene protects the conductors from swelling, abrasion and mechanical damage.

Hazard manufactures a full line of power and portable cables for mines.

- For shaft and borehole power cable, Hazard Spiralweave gives excellent service in ordinary use, and steel wire armored submarine type in deep mines.
- Hazard Armortite Non-Metallic Armored Cable is recommended for inside power transmission.
- Hazacord Flexible Cables for mining machines, cable reels and electric shovels are very resistant to oil and abrasion. Hazard Insulated Wire Works, Division of The Okonite Company, Passaic, New Jersey.

HAZARD MINERS' LAMPCORD

HAZARD

insulated wires and cables for every mining use

4088

WIRE ROPE NOW FOR KNOWN

● A new wire rope sling service that offers these outstanding features: *1.* Every **ACCO** "Registered" Wire Rope Sling is proof tested to twice the rated capacity. *2.* Certificate of test and registry showing actual proof test load and rated strength is furnished. *3.* Each sling identified with metal registry tag. *4.* Made only from Preformed Wire Rope of Improved Plow Steel Grade.

ACCO "Registered" Service helps you select the right wire rope sling for your particular job—then registers and identifies it for known strength.

ACCO

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Tacoma, Bridgeport, Conn.

HAZARD WIRE ROPE DIVISION
AMERICAN CHAIN & CABLE

ACCO TRADE MARK

In Business for Your Safety

SLINGS ACCO Registered STRENGTH

Send for this Bulletin which gives you 7 reasons why ACCO "Registered" Wire Rope Slings give you known strength

★ ★ ★ ★ ★

"Under any name it's a Fine Product"... says Rōmey

When you order Rome Synthinol Thermoplastic Insulated Wires, the new type designation for SN, for dry locations, is now **T**, and SNW, for wet locations, has been changed to **TW**.

These insulations combine a wide range of advantages, such as high resistance to moisture, acids, and corrosion, excellent dielectric strength, toughness.

The finished wire is free stripping, is available in many bright colors, is small in diameter, and has a smooth and lubricated surface for easy pulling.

We will gladly send samples and price sheets.

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60 East 42nd Street, Zone 17
Phone—Murray Hill 2-6590

CHICAGO
208 S. Jefferson Street, Zone 6
Phone—Randolph 6936

PITTSBURGH
2537 Koppers Bldg., Zone 19
Phone—Atlantic 0816

PHILADELPHIA
Broad & Arch Streets, Zone 7
Phone—Locust 7743

CLEVELAND
850 Euclid Avenue, Zone 14
Phone—Cherry 5957

LOS ANGELES
327 East 4th Street, Zone 13
Phone—Mutual 5093

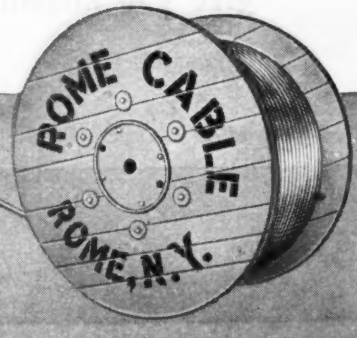
DETROIT
New Center Bldg., Zone 2
Phone—Trinity 2-7578

WASHINGTON
14th & N. Y. Ave. N.W., Zone 5
Phone—National 3934

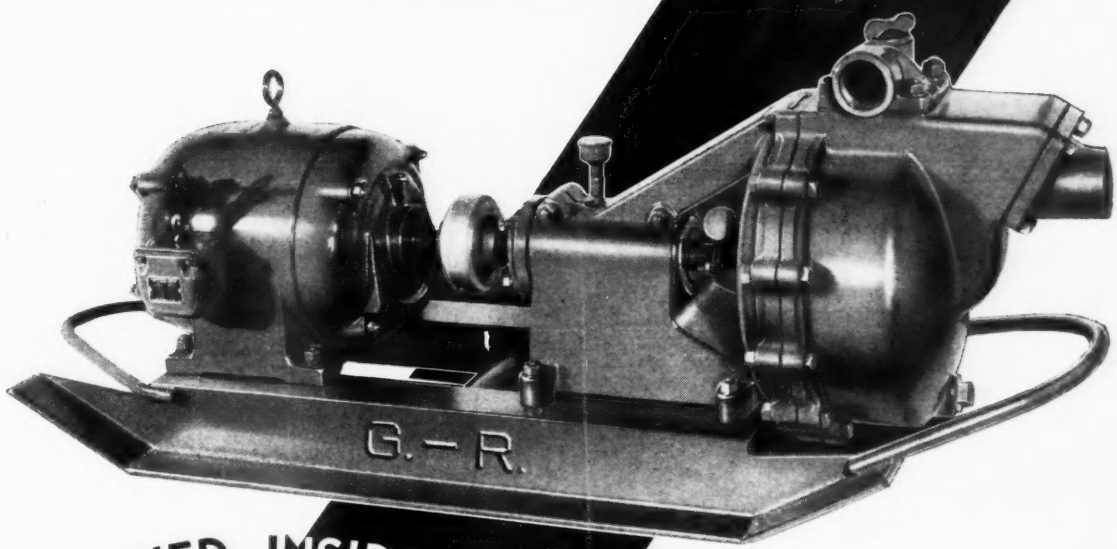
BOSTON
Box 63, Marshfield Hills
Phone—Marshfield 41

FROM BAR TO FINISHED WIRE

ROME CABLE CORPORATION
ROME • NEW YORK



YOU NEVER BEFORE GOT ALL THIS IN A DRAINAGE PUMP



STREAMLINED INSIDE WHERE STREAMLINING COUNTS

GORMAN-RUPP PUMPS
UNSURPASSED FOR PUMPING FAST
ARMY NAVY

Operate this Gorman-Rupp pump for months at a time, without rest, if you wish. It's built for that kind of job. Or give it intermittent service, either automatic or remote controlled. Its complete self-priming makes this easy. Start, run and stop, it requires no attention.

Gorman-Rupp self-priming centrifugal pumps for mine service are the simplest made. There is only one moving part, the impeller. This turns at motor speed to eliminate reduction gears and other wearing parts. No valves or by-passes are used to establish a prime and, the rest of the time, decrease efficiency. These pumps will handle any size solid that will pass the intake strainer, without clogging or damaging the mechanism.

When repair or maintenance becomes necessary, this may be done by unskilled labor with common shop tools and with complete assurance of a satisfactory job. Parts subject to eventual wear and corrosion are easily accessible.

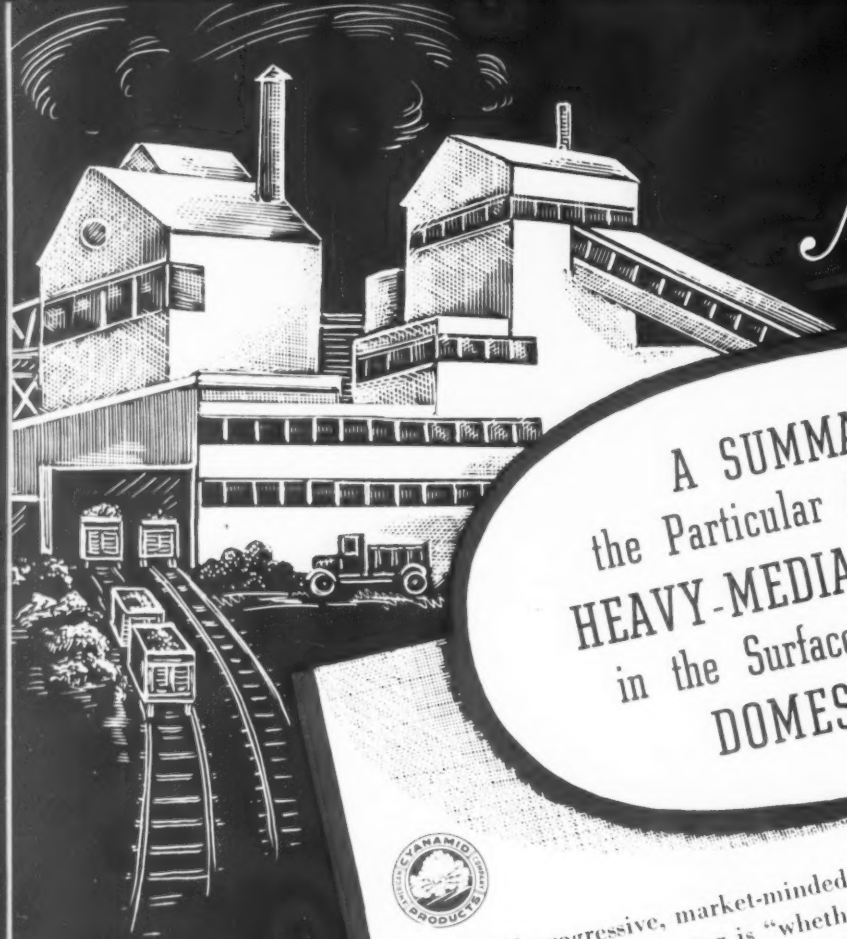
Various sizes of Gorman-Rupp mine gathering pumps may be had in capacities from 4,500 to 15,000 gallons per hour and heads up to 125 feet. These models are described in bulletin MP-2. Write for a copy and see what you can really get in pump value.

CAPACITY HEAD TABLE IN GALLONS PER HOUR

Total Head Feet	20	40	60	80
MODEL 40-40	6900	3900		
MODEL 60-60	9600	7500	4200	
MODEL 60-100	10800	9600	8100	6300
MODEL 125-100	13200	12600	11400	9000

THE GORMAN-RUPP COMPANY

MANSFIELD • OHIO



Not "Whether"

but – "

A SUMMARY OF the Particular Advantages of HEAVY-MEDIA SEPARATION in the Surface Preparation of DOMESTIC COAL

To all progressive, market-minded domestic coal producers the question no longer is "whether to clean" but "how to clean *most effectively and efficiently*".

Cyanamid has demonstrated that Heavy-Media Separation has many outstanding advantages over existing methods of coal preparation, particularly in the treatment of coal containing a relatively high percentage of near-gravity material and where the percentage of waste material is high. These advantages stem from inherent fundamental principles:

1. Because Heavy-Media Separation operates at equal efficiency of separation at any pre-selected gravity from 1.25 to 3.4, it can be used with equal effectiveness on bituminous, semi-bituminous or anthracite.

Heavy-Media Separation depends for its efficiency upon the immutable law of gravity rather than upon the hard-to-control dynamics of moving bodies in moving air or liquids. Once the medium gravity is set, it can be maintained within ± 0.01 gravity, or easily and quickly altered to meet changed characteristics of feed coal.

No other process can achieve continuously the same accuracy and flexibility. The superiority of Heavy-Media Separation is particularly evident in the treatment of feed coal having a high percentage of near-gravity material at the separating-gravity desired.

AMERICAN CYANAMID COMPANY
30 Rockefeller Plaza, New York 20, N. Y.

"How Best to Prepare Domestic Coal"

2. Heavy-Media Separation plants can be designed to give multiple-product separation from run-of-mine feed coal in a full size range without presizing to meet any established or future standard for any coal market.

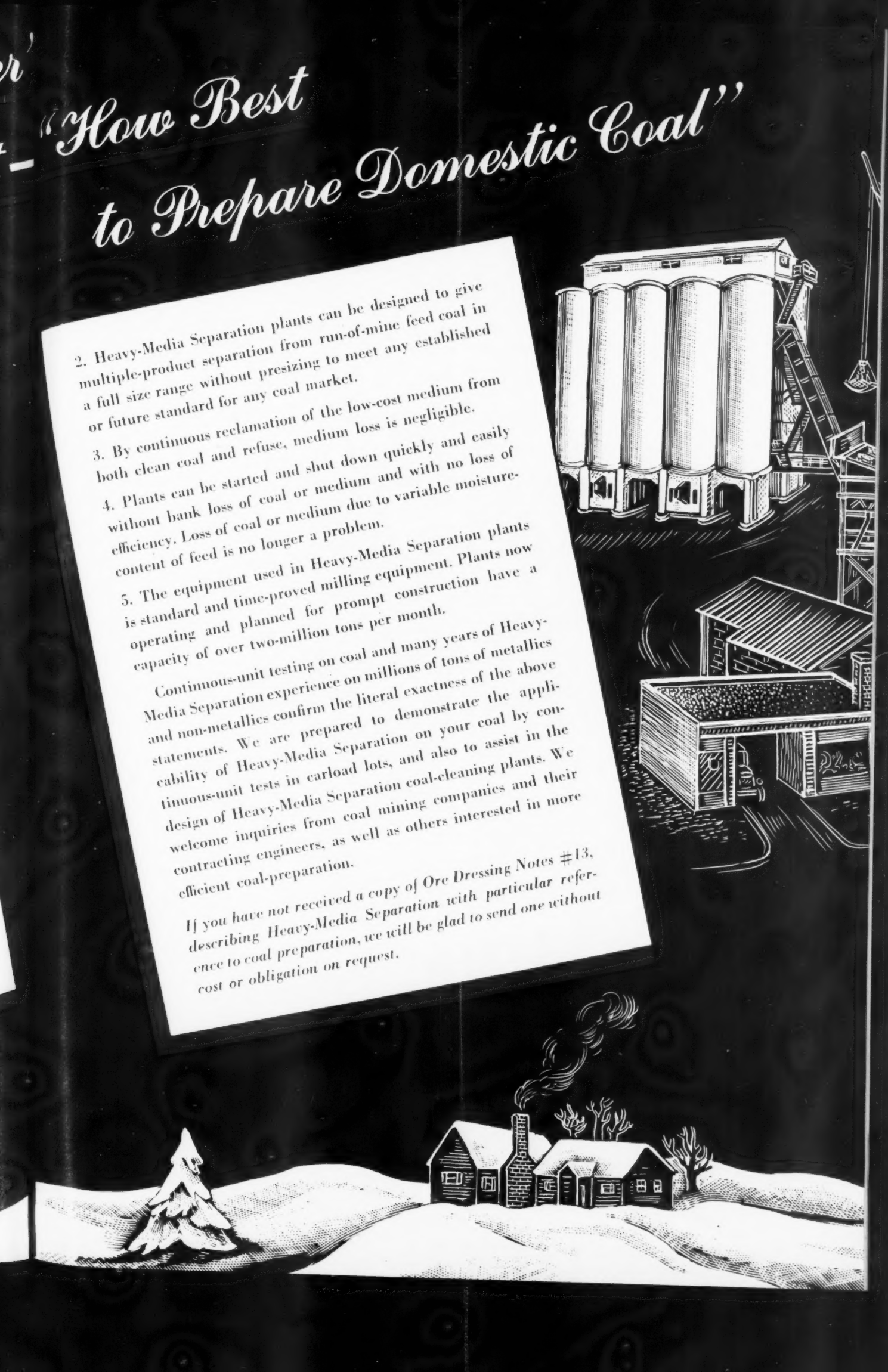
3. By continuous reclamation of the low-cost medium from both clean coal and refuse, medium loss is negligible.

4. Plants can be started and shut down quickly and easily without bank loss of coal or medium and with no loss of efficiency. Loss of coal or medium due to variable moisture-content of feed is no longer a problem.

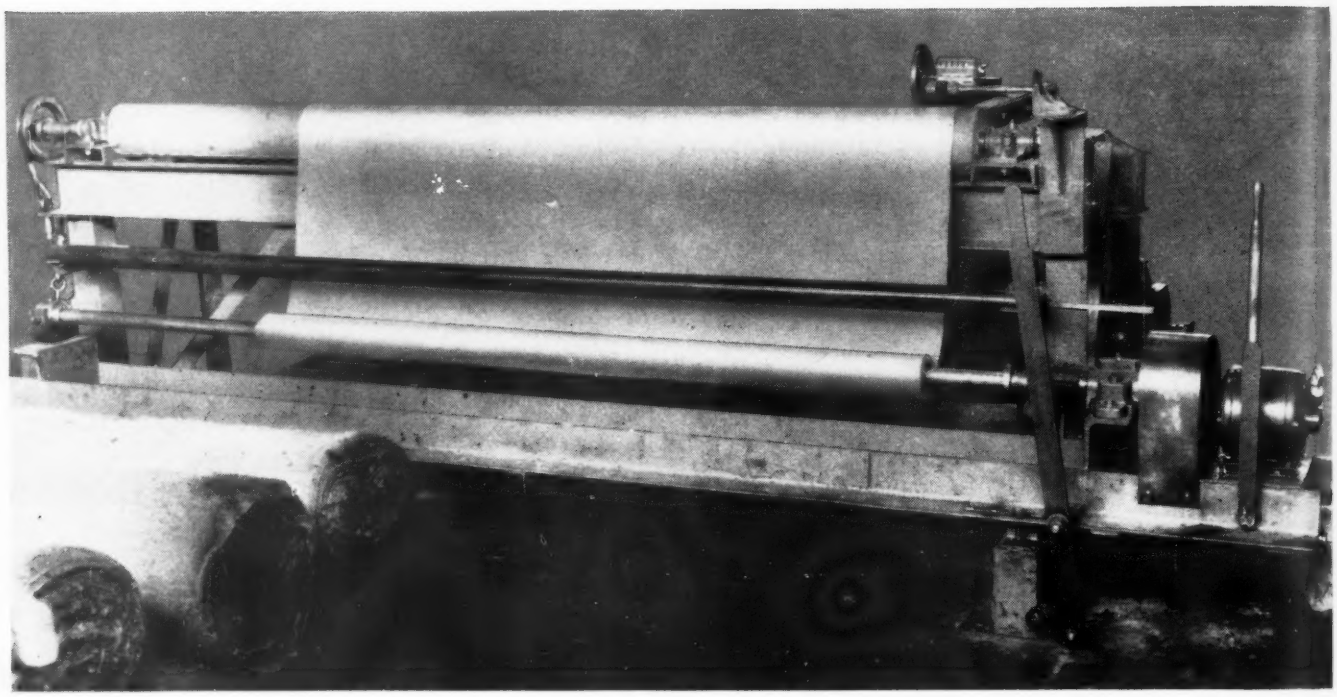
5. The equipment used in Heavy-Media Separation plants is standard and time-proved milling equipment. Plants now operating and planned for prompt construction have a capacity of over two-million tons per month.

Continuous-unit testing on coal and many years of Heavy-Media Separation experience on millions of tons of metallics and non-metallics confirm the literal exactness of the above statements. We are prepared to demonstrate the applicability of Heavy-Media Separation on your coal by continuous-unit tests in carload lots, and also to assist in the design of Heavy-Media Separation coal-cleaning plants. We welcome inquiries from coal mining companies and their contracting engineers, as well as others interested in more efficient coal-preparation.

If you have not received a copy of Ore Dressing Notes #13, describing Heavy-Media Separation with particular reference to coal preparation, we will be glad to send one without cost or obligation on request.



One Reason Upson-Walton Brattice Cloth is Better Brattice Cloth



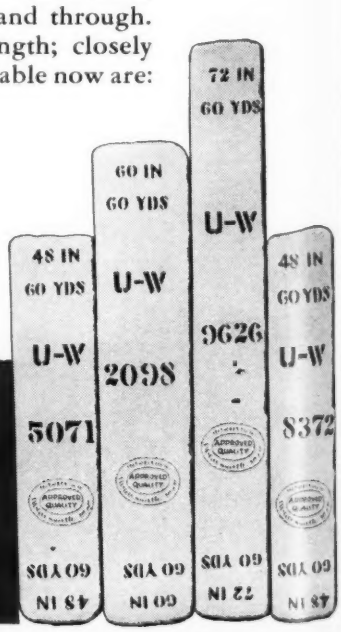
EVERY FIBRE GUARANTEED NON-INFLAMMABLE

ILLUSTRATED above is a new machine, designed by our own engineering department, to simplify and improve our production of quality brattice. *Every yard, every inch, every fibre* of the brattice that leaves this Upson-Walton rollometer is assured quality and guaranteed non-inflammable through and through. Made from long fibre twisted jute yarn for strength; closely woven to exclude gases and dust and retain air. Available now are:

UW 9626—medium weight, single warp cloth.

UW 8372—heaviest single warp cloth, for use where operating conditions are severe.

NOTE: UW 5071—medium heavy, single warp—and UW 2098—extra heavy double warp are now unavailable due to wartime restrictions. They will be returned to the Upson-Walton line just as soon as it is possible for us to make them.

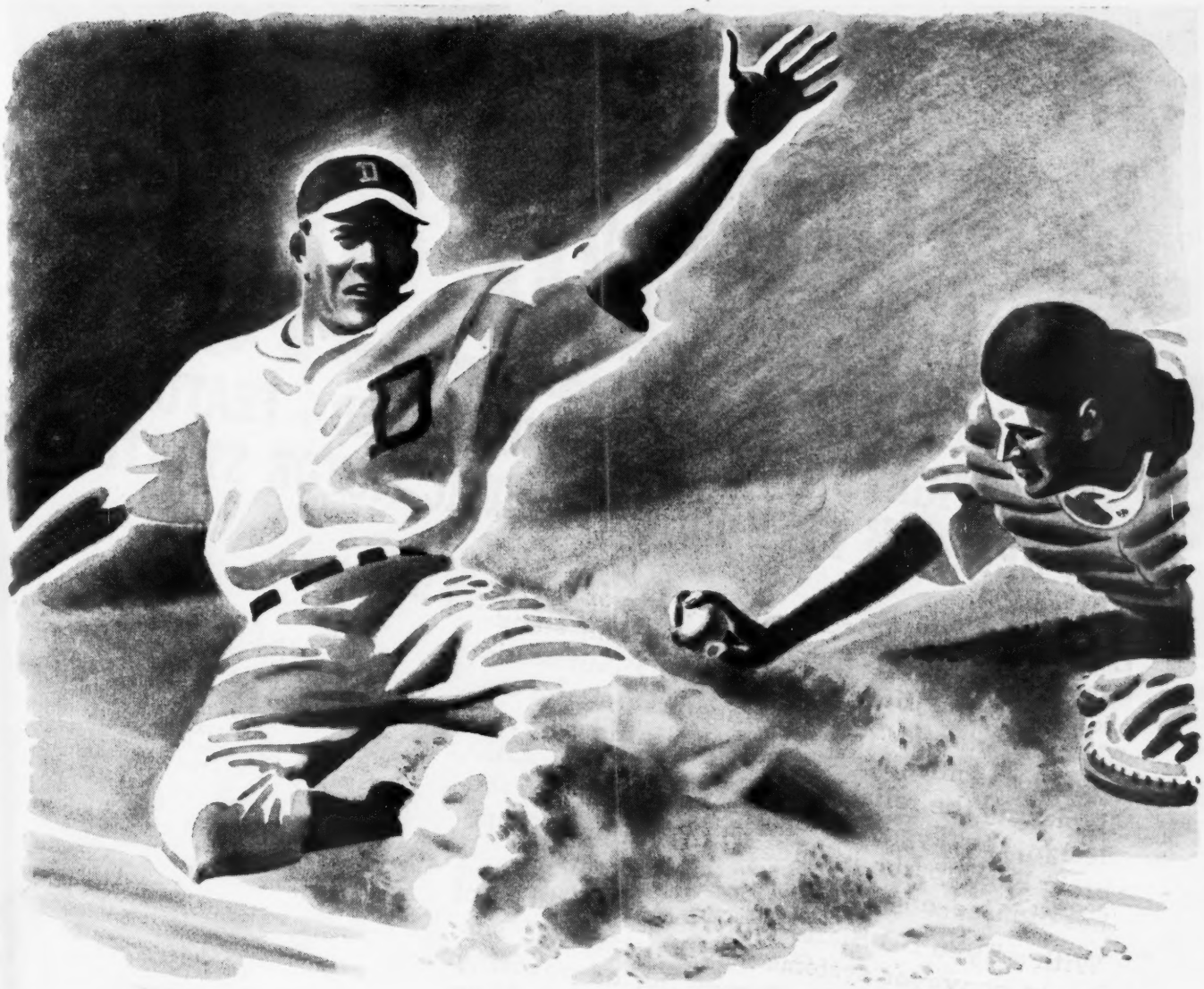


THE UPSON-WALTON COMPANY

Manufacturers of Wire Rope, Wire Rope Fittings, Tackle Blocks

MAIN OFFICES AND FACTORY: CLEVELAND 13, OHIO

114 Broad Street, New York 4 — 737 West Jackson Boulevard, Chicago 6 — 241 Oliver Building, Pittsburgh 22



...safe by ~~inches~~ OUNCES

Practice makes perfect! To master the split-second technique of successful base-stealing, many a baseball player *practices* with a few ounces of LEAD in his shoes—deliberately handicapping himself during the training season so he will have a "plus" in speed for the pinches.

It is that same PRICELESS "PLUS" that pays off in a product . . . a process . . . a "know how." It is that PRICELESS "PLUS" that has made Hewitt industrial rubber products outstanding for 85 years . . . that led to Hewitt's pioneering leadership in the synthetic rubber field 14 years ago . . . that makes buyers realize that when it comes to JOB-ENGINEERED Industrial Rubber Products, "Hewitt Can Do It!"

★ ★ ★

Specify "Hewitt" for quality industrial rubber products. Phone the Hewitt distributor listed in the Classified Section of your telephone directory . . . or write Hewitt Rubber Corporation, 240 Kensington Avenue, Buffalo 5, New York.

HEWITT RUBBER *of Buffalo*

Job-Engineered Industrial Hose • Belts • Molded Goods

QUALITY RUBBER PRODUCTS FOR INDUSTRY FOR 85 YEARS

for the INSIDE STORY

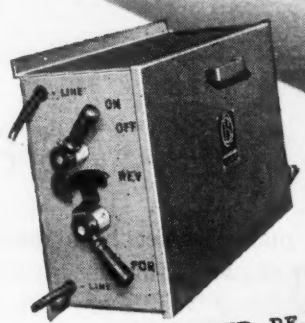
INVESTIGATE THESE MINE-ENGINEERED* FEATURES OF THE NEW O-B TYPE BD AUTOMATIC MOTOR STARTER

FOR THE positive control of conveyor drives and other motor-operated equipment, standardize on the new O-B Type BD Automatic Motor Starter--a *mine-engineered* *starter designed specifically for rugged mining service. Replacing the reliable, time-proved Type KAD design, the Type BD incorporates many of the basic KAD parts; includes, in addition, a number of *mine-engineered* *improvements.

With a Type BD Starter, interlocking control of group conveyor systems may be achieved simply and easily without complicated rewiring. Motors may be started smoothly and evenly regardless of low line voltage or excessive motor load. Protection from abusive overloads and short circuits is afforded.

Keep your motors running at top efficiency by letting Type BD Motor Starters handle the vital control function. And when buying new equipment, make certain it is equipped with O-B Type BD Starters. Specify them on your next order.

MAJOR PARTS INTERCHANGEABLE WITH KAD STARTER--uses same contactors and parts, same thermal overload unit and same starting resistance as time-proved O-B Type KAD design.



SELF-CONTAINED REVERSING SWITCH--if desired, Type BD Starter may be equipped with reversing switch, interlocked with control switch to prevent reversal with power "on."

Clip and Mail for Complete Data

OHIO BRASS COMPANY, Mansfield, Ohio

I'd like to have more information concerning your new Type BD Automatic Motor Starter. Please send me a copy of Booklet 792M giving complete data.

Name .....

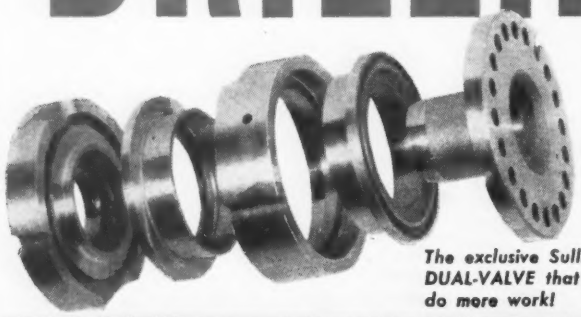
Title .....

Company .....

Address 2563-M

FOR MOTORS FROM 5 TO 75 H. P., 250 AND 550 VOLTS D. C.--Furnished with single-step starting for motors from 5 to 25 h.p. incl., with two-step starting for motors from 25 to 75 h.p. incl.

DRILLING ROCK?



The exclusive Sullivan thrifty DUAL-VALVE that makes Air do more work!

SULLIVAN L-47 AIR DRILL

For taking up bottom, brushing roof and all the general utility rock jobs. Has exclusive Sullivan DUAL-VALVE for more efficient operation. 55 pound performance in a 45 pound class drill!

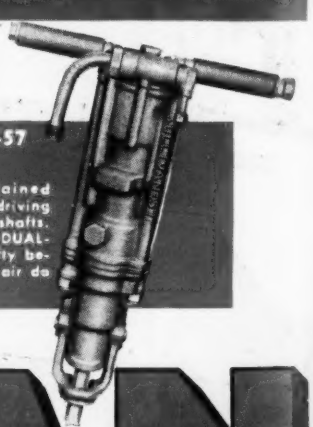
...look to Sullivan...

Wherever there is a rock drilling application in a coal mine, it's logical to look to Sullivan for the rock drill. Sullivan is one of the oldest and largest manufacturers of rock drills and one of the world's leading suppliers of coal mining machinery. No other manufacturer of rock drills offers the coal mine such a complete line or such a combination of background and experience. That's why it will pay you dividends to call the nearest Sullivan office for literature and information when you need rock drilling equipment.

Sullivan Machinery Company. Executive Offices: Michigan City, Indiana. In Canada: Canadian Sullivan Machinery Company Ltd., Dundas, Ontario.

SULLIVAN L-1 DRILL

Widely used in anthracite properties for drilling both coal and rock. A 30 lb. husky that will stay on the job and do more work in less time.



SULLIVAN L-57 DRILL

For heavy, sustained rock work such as driving slopes and sinking shafts. Has the exclusive DUAL-VALVE that's thrifty because it makes the air do more work!

SULLIVAN

SALES OFFICES IN: Birmingham - Butte - Chicago - Dallas - Denver El Paso - Huntington - Knoxville - Middlesboro - New York - Philadelphia Pittsburgh - Seattle - San Francisco - Salt Lake City - Scranton - St. Louis

SULLIVAN PRODUCTS—Coal Mining Machines - Scraper Haulers - Hoists Rock Loaders - Car Pullers - Air Compressors - Coal Drills - Rock Drills Cutter Bit Sharpeners and Heaters - Core Drills and Contract Core Drilling

"I can't raise prices— and I've got to pay the scale— what next?"

★ Making a profit is fundamental to success in the American system of business. Coal mining is recognized as a major American industry . . . it must continue to succeed. Yet, today, the above quoted statement is running through the minds of coal mine operators everywhere.

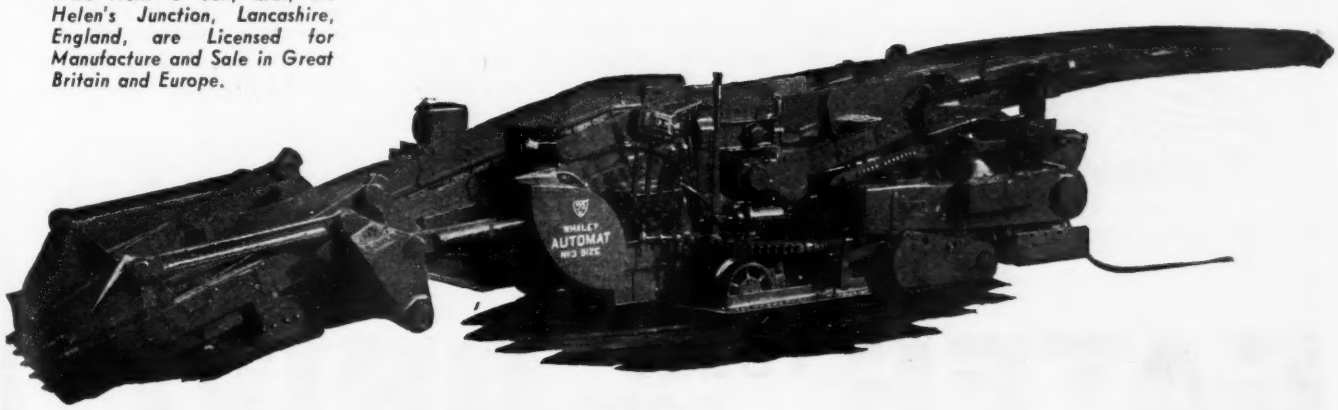
— "what next?" Solving this question is the problem. Obviously, the solution lies in more efficient use of labor . . . more tonnage per man employed.

Whaley "Automats" have, for years, been increasing the tons per man hour in coal loading and increasing the efficiency of labor in dead-work by the rapid and more efficient loading of rock in the taking of top and bottom . . . in brushing or grading, and in the cleaning up of entries, air courses, etc.

You need the long-life Whaley "Automat" now more than ever before. You need the labor saving efficiency of the "Automat's" exclusive shoveling action. You need this machine that loads, in its stride, any lump of coal that can pass through your tipple, or any size rock your cars, aerial trams or larries can take.

We would like to go into your problems with you. When writing, please give us information on your conditions. Myers-Whaley Co., 175 Proctor Addn., Knoxville 6, Tennessee.

Wm. Neill & Son, Ltd., St. Helen's Junction, Lancashire, England, are Licensed for Manufacture and Sale in Great Britain and Europe.



★MYERS-WHALEY

Mechanical Loaders Exclusively For Over 37 Years

T WORK...

You can't keep the Sales Force on Ice

More than cars is required to move coal.

Coal moves because sales agents and distributors have learned where to find a home for hundreds of different sizes and kinds. For the producer who does not maintain his own sales force this fact is vital to the operation of his mine.

Years were needed to acquire the "know how" which, in normal times, assures that the right kind of coal will arrive at the right place . . . at the right price.

BUT . . . times are not normal. The fact that the industry temporarily has more customers than coal can be dangerous.

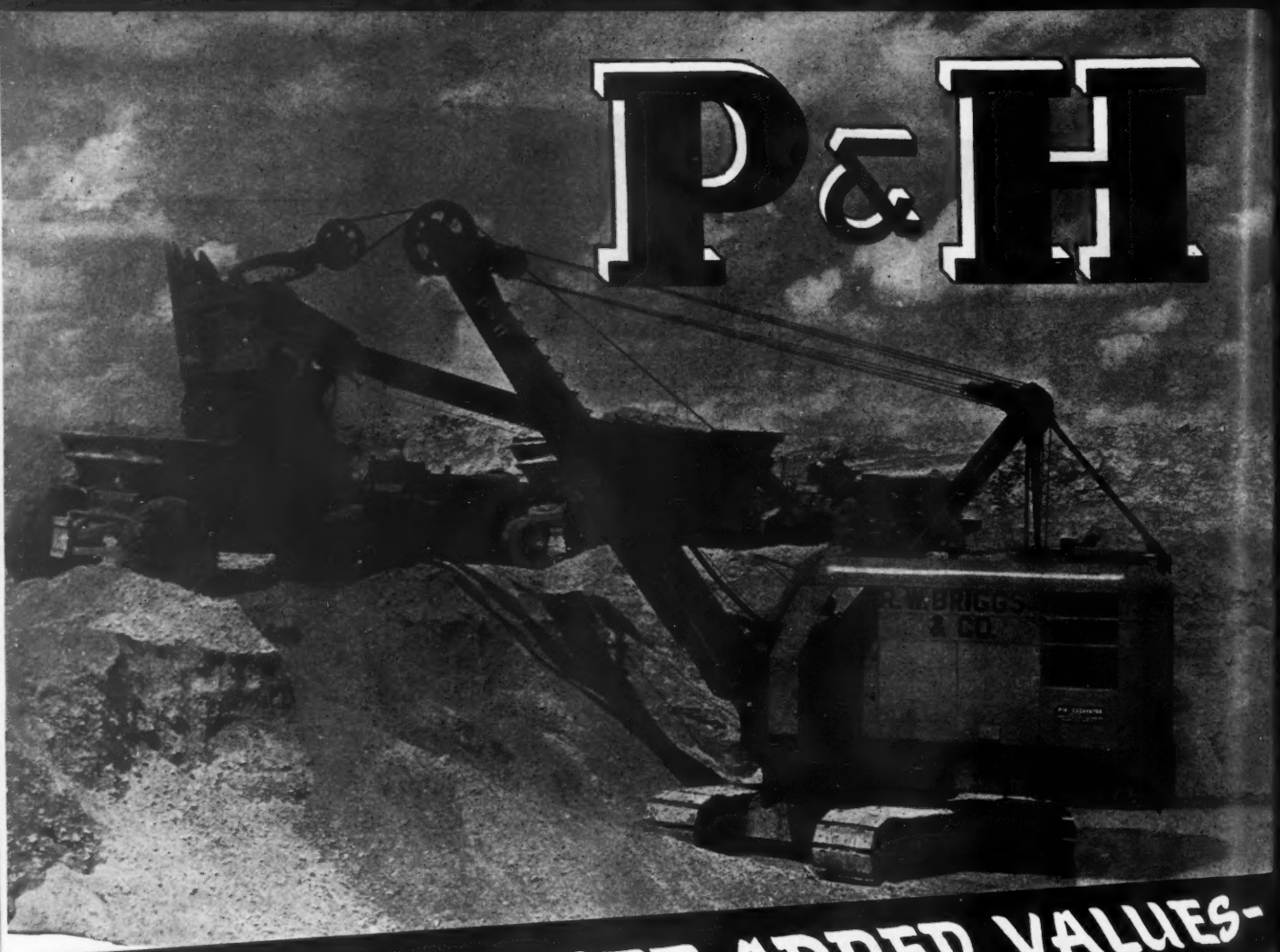
If producers, by reducing or eliminating commissions and discounts, use present emergency conditions to pare down or destroy the efficiency of their sales agency and distributing companies, post-War competition will hand the coal industry a "haymaker."

Anybody can sell coal now . . . but just anybody won't be able to sell it when Uncle Sam stops issuing directives . . . markets decline . . . and surplus tonnage rises.

A good sales company is your best post-War insurance. Continue your normal sales relations now . . . don't use a "duration" opportunity to freeze out your distributor. YOU CAN'T KEEP HIM ON ICE . . . turn him on or off like a light bulb . . . or find him around the corner when you need him. Keep your sales pumps primed.

No trans-shipper scuttles ships because the lakes are frozen. No coal producer should scuttle seasoned sales outlets now for a few extra highly taxable dollars.

ASSOCIATION . . . Washington, D. C.



HOW TO GET ADDED VALUES-

Freedom from Crawler Troubles. P&H's true rolling crawlers will save you time and trouble for years to come. Operating on the true roller chain principle, crawler belts roll smoothly with double sprocket drive. All driving wear is put on renewable pins; high replacement costs are eliminated.

Greater Strength with All-Welded Construction of Rolled Alloy Steels. Both upper and lower structures are all-welded . . . stronger, more rigid, more rugged. Entire units are jig-drilled and machined, assuring proper permanent alignment of shafting and bearings — interchangeability of repair parts. Greater strength and rigidity will save you many a repair bill.

P&H excavators are built in sizes up to 6 cubic yards capacity with gasoline, Diesel or electric power.

Smooth Hydraulic Control — Easier on Men and Machines. This proved low pressure system with independent controls gives you instant response — smoother, easier, with less effort. Wear and loosening common to shafts, reach rods, pins and toggles are eliminated. Fewer parts mean less wear, less maintenance. These are but a few of the added values that make P&H Excavators a more profitable investment.

P&H

EXCAVATORS

4540 West National Avenue,
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HARNISCHFEGER
CORPORATION

EXCAVATORS • ELECTRIC CRANES • ARC WELDERS P&H HOISTS • WELDING ELECTRODES • MOTORS

Desert heat so sizzling it hatches out an ostrich and sends him scooting for shade, is just cool weather to the tough insulation protecting U. S. Royal Mining Machine and Locomotive Cables. Subjected to torturing temperatures—both high and low—stretched, twisted, bent, battered and soaked, all types of U.S. Royal Cords and Cables are Safety-Tested by gimlet-eyed laboratory technicians. And under the severest checks in actual service they have widely demonstrated their durability, their lasting circuit-integrity, their definite economy for any mine operator.

THE NEW U. S. ROYAL *Safety Tested*

MINING MACHINE AND LOCOMOTIVE CABLES

Listen to "Science Looks Forward"—new series of talks by the great scientists of America—on the Philharmonic-Symphony Program. CBS network, Sunday afternoon, 3:00 to 4:30 E.W.T.

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SERVING THROUGH SCIENCE ***WITH ELECTRICAL CORDS AND CABLES***

9 MARIONS

The latest MARION machines to be installed at Fairview Collieries Corporation Flamingo Mine are, a 7200 walking dragline with 100 ft. boom and a 7 cubic yard bucket for stripping overburden, and a MARION 4121 knee-action coal loader with a 7-½ cubic yard dipper.

THERE MUST BE A REASON!

Dependable performance, high production, low operating cost, and long life are a few of the reasons why Ayrshire-Patoka Collieries, parent company of Fairview Collieries Corporation, has bought nine MARIONS to date.

Marion has a machine that is just right for your work. Let's talk it over.

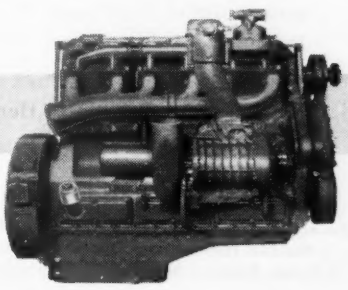
THE MARION STEAM SHOVEL CO.
Marion, Ohio
¾ cubic yard to 35 cubic yards

Of this... YOU CAN BE *SURE*

SURPLUS POWER IS PROTECTION . . . protection against the damaging shocks, jerks and strains that add to the abuse and shorten the life of powered mining equipment when there is barely "enough power" for *normal* requirements. *Surplus power* is protection, too, against lagging work cycles or accidents because reserve power is always available to handle peak loads or to meet any emergency.

For your stripping, loading, hauling or cutting equipment, you can be sure of *surplus power* at the minimum cost in space and weight by standardizing on Cummins Dependable Diesels. Three compact, low-weight-per-horsepower models—150, 200 and 275 hp.—have almost the same mounting dimensions and may be used interchangeably in many cases. All have the same basic design and incorporate a large percentage of the same parts. This assures a simplified service procedure and reduces the parts inventory . . . important points in holding down costs and increasing profits.

Have you carefully considered these advantages in specifying Cummins Diesels for your equipment?



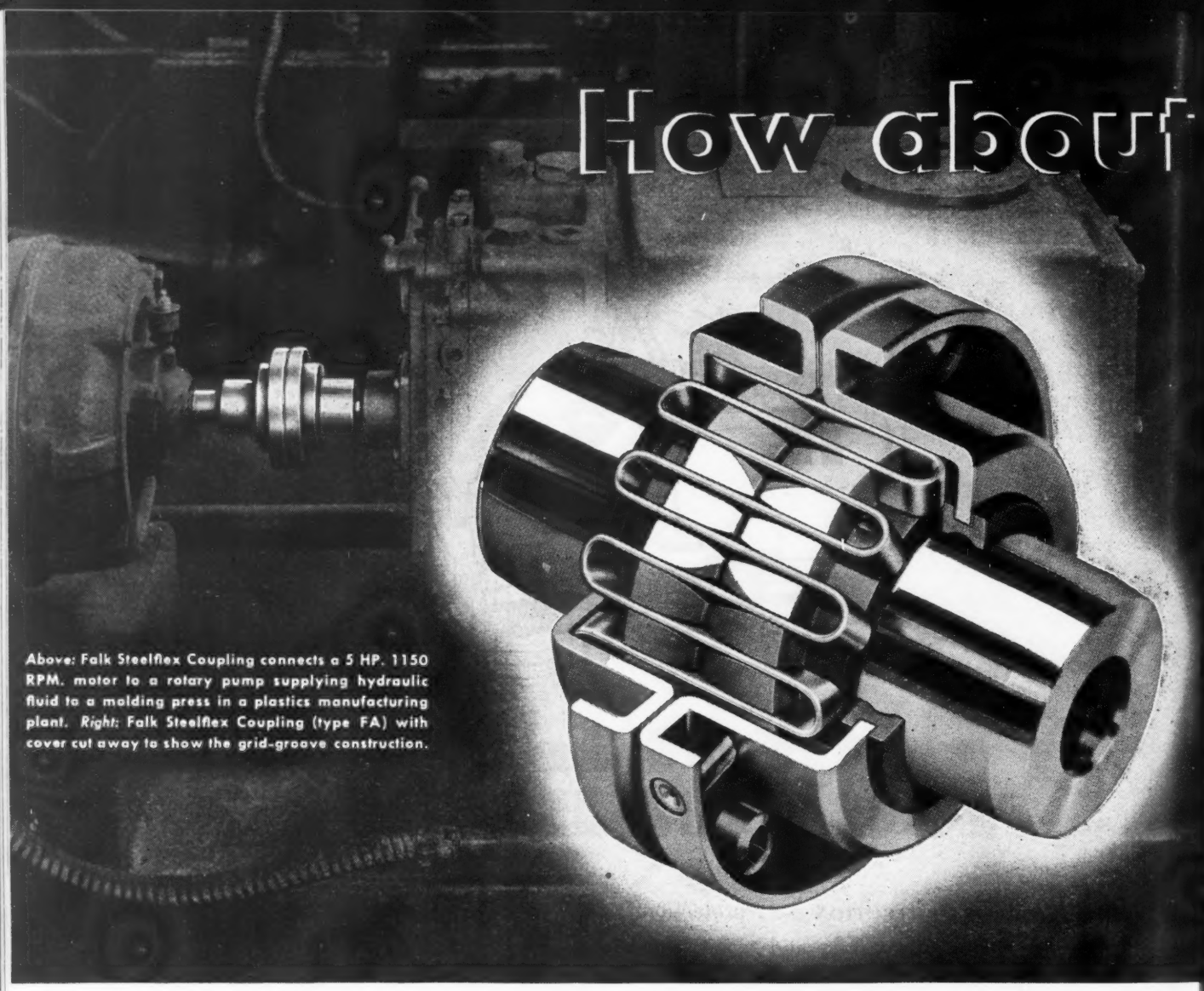
Illustrated is the supercharged, 275 hp. Model NHS Cummins Diesel. In design, dimensions and weight it closely approaches the 150 hp. Model H and the 200 hp. Model NH. All are designed for mining service. Ask for specifications.

CUMMINS *Dependable* DIESELS

SINCE 1918...PIONEER OF PROFITABLE POWER THROUGH HIGH SPEED DIESELS

CUMMINS ENGINE COMPANY, INC., COLUMBUS, INDIANA

How about a



Above: Falk Steelflex Coupling connects a 5 HP. 1150 RPM. motor to a rotary pump supplying hydraulic fluid to a molding press in a plastics manufacturing plant. *Right:* Falk Steelflex Coupling (type FA) with cover cut away to show the grid-groove construction.

Flexible and Resilient Grid-Groove Design Effectively Cushions Loads . . . Absorbs Shocks . . . Adjusts for Misalignment . . . Provides for End Float

FALK Engineers have long recognized the importance of, and necessity for, connecting the shafts of a driving and a driven member by a coupling that is both flexible and torsionally resilient.

As pioneers in the design and manufacture of precision gear drives, these engineers know that a coupling must be resilient to the degree that it definitely improves the character of the motion imparted to it.

This qualification extends beyond the mere connecting of shafts under slight angular and parallel misalignment without imposing undue loads on the bearings and shafts of connected machinery—which is the ordinary concept of coupling design.

In addition to providing flexibility and torsional resilience, proper coupling design dictates the use of materials that will insure years of trouble-free service.

Therefore Falk Steelflex Couplings provide both essentials of desirable coupling performance, insuring *both* flexibility and the torsionally resilient action that so effectively cushions loads, absorbs shocks, dampens vibration, adjusts for angular and parallel misalignment, and allows free end float for the shafts of driving and driven members.

How and why Falk Steelflex Couplings do all this is explained on the opposite page. Here, indeed, is a short course in efficient coupling design.

THE FALK CORPORATION, MILWAUKEE 8 WISCONSIN

For over fifty years precision manufacturers of Speed Reducers . . . Motoreducers . . . Flexible Couplings . . . Herringbone and Single Helical Gears . . . Heavy Gear Drives . . . Marine Turbine and Diesel Gear Drives and Clutches . . . Contract Welding and Machine Work. • District Offices, Representatives, or Distributors in principal cities.

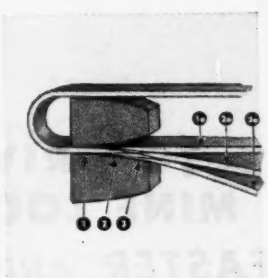
IT ALWAYS PAYS TO CONSULT **FALK**

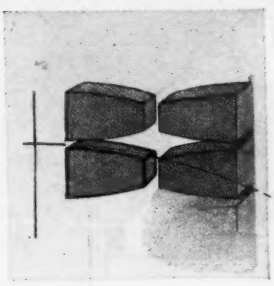
a short course in

Coupling Design?

WHY and HOW Falk Steelflex Couplings Perform Better

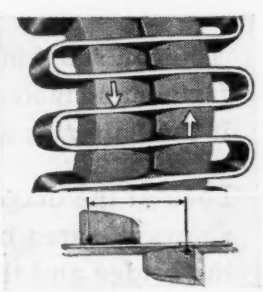
OW THE GRID-GROOVE DESIGN FUNCTIONS. Power is transmitted hrough a resilient grid member made of hrome alloy steel with an elastic limit of 25,000 pounds per square inch and an ltimate strength of 250,000 pounds er square inch. This grid fits snugly into urved grooves cut into the hubs of the oupling.

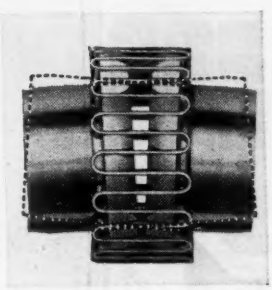




HOW THE GROOVES ARE DESIGNED. The identical hubs are moderately high carbon bar steel, forged steel, or Falk alloy cast steel. Into these hubs, grooves are cut in a precise arc, with radius and length proportional to the size of the coupling, to provide a snugly fitting slot for the grid member and a bearing surface from outer to inner edge of the hub.

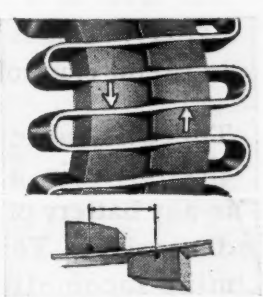
T LIGHT LOADS, the grid member ears only at the outer edges of the urved grooves in the coupling hub, as hown at right and at *1* and *1a* in the diaram above. This permits a long, free lastic span between the outer edges of oth hubs. Power is transmitted through most the entire length of the resilient ngs of the grid member.

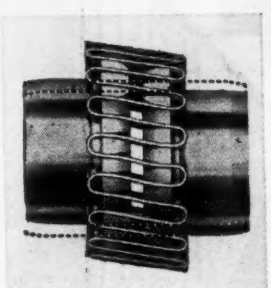




ANGULAR MISALIGNMENT. Under angular misalignment the design of the Falk Steelflex coupling permits a rocking and sliding action of grid and hubs that allows the greatest freedom of accommodation to angular misalignment, while at the same time transmitting the power through the resilient grid with no lost motion or backlash.

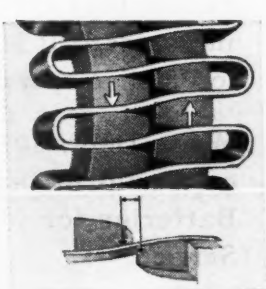
T NORMAL LOADS, the grid bears n a larger area of the grooves (*2*, *2a* in diagram) and the span of the rid is automatically shortened as the oad increases, enabling it to transmit ore power without increasing internal ress. The grid member maintains its pacity to absorb shocks, dampen ibration, and cushion the load.

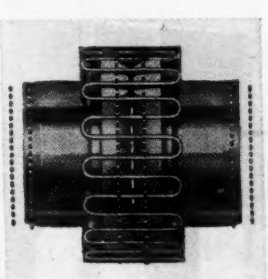




PARALLEL MISALIGNMENT. When parallel misalignment is involved, the resilience of the grid-groove combination comes into full play. The movement of the grid in the lubricated grooves accommodates the misalignment, while still permitting full function of the grid-groove action of the coupling in absorbing shock and dampening vibration.

T PEAK LOADS, the rungs of the grid ember then bear over almost the enre curved surfaces of the grooves (*3*, *3a* in diagram) and the span of the grid ecomes very short. The coupling still mains torsionally resilient. Also under e impact of shock loads the grid ember flexes and transmits power moothly and evenly.





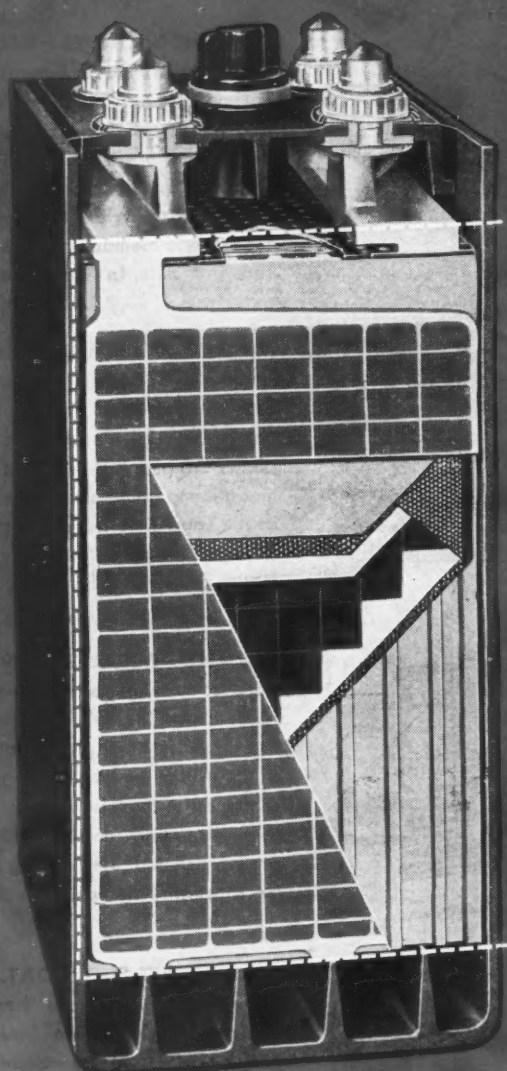
PERMITS FREE END FLOAT. Because the grid member slides freely in the lubricated grooves, the Steelflex coupling permits free and independent end float for the shafts of both the driving or driven members, or of either one. If it is desired that end float be restricted, provision can be made to limit it to any required amount.

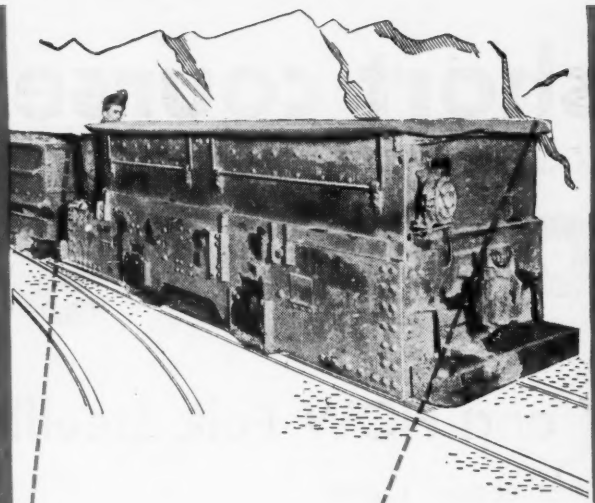
There are 13 types and 33 sizes of Falk couplings to meet all requirements. For specific information and recommendations to meet your needs, call the nearest Falk representative or distributor.

FALK ... A GOOD NAME IN INDUSTRY

KATHANODE

HAS MORE WORKING *Electrolyte*





TO DRIVE YOUR MINE LOCOMOTIVE *FASTER AND FARTHER!*

You can run your mine locomotive farther and faster on a single charge if the batteries are Kathanode.

Look at the diagram at the left. It shows the area between the top of the bridge and the normal electrolyte level in a typical Kathanode battery. This is the space devoted to useful electrolyte.

There is more of this *working electrolyte* in a Kathanode than in any battery of the same over-all dimensions. To you it means that mine locomotive speed is sustained, trips are faster and greater in number. It is economical mine locomotive operation.

Write Dept. 107 for Catalog 200 on Gould Kathanode Glassklad Batteries for Mine Locomotive Service.

GOULD

PIONEER OF GLASSKLAD CONSTRUCTION

GOULD STORAGE BATTERY CORPORATION, Depew, N. Y. Factories: Atlanta • Chicago • Dallas • Depew • Leavenworth
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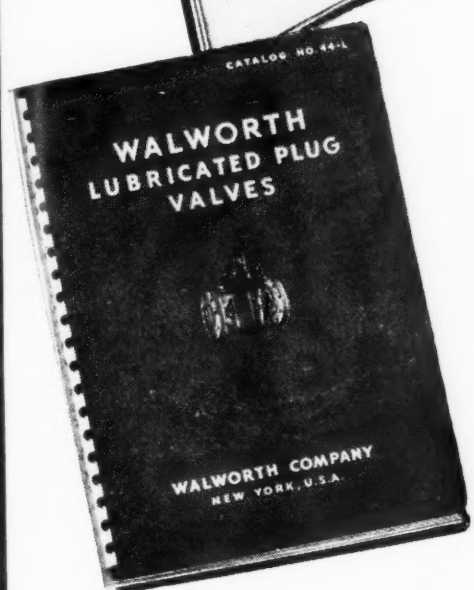
YOUR NEW
Walworth Lubricated Plug Valve Catalog
IS NOW READY!



Write for your copy today
on your Company letterhead

Between the covers of this 94-page book you will find ways that Walworth can help you with your problem of handling petroleum products . . . acids . . . condensates . . . mud . . . organic solvents . . . slimes . . . slurries . . . and many other "difficult" liquids where conventional types of valves do not give satisfactory service. It is to your advantage to have this informative, important data.

A request on your company's letterhead, will bring you a copy of Catalog 44L. Write now!

ARMY NAVY

14 AWARDS
TO 4 PLANTS

WALWORTH
valves and fittings
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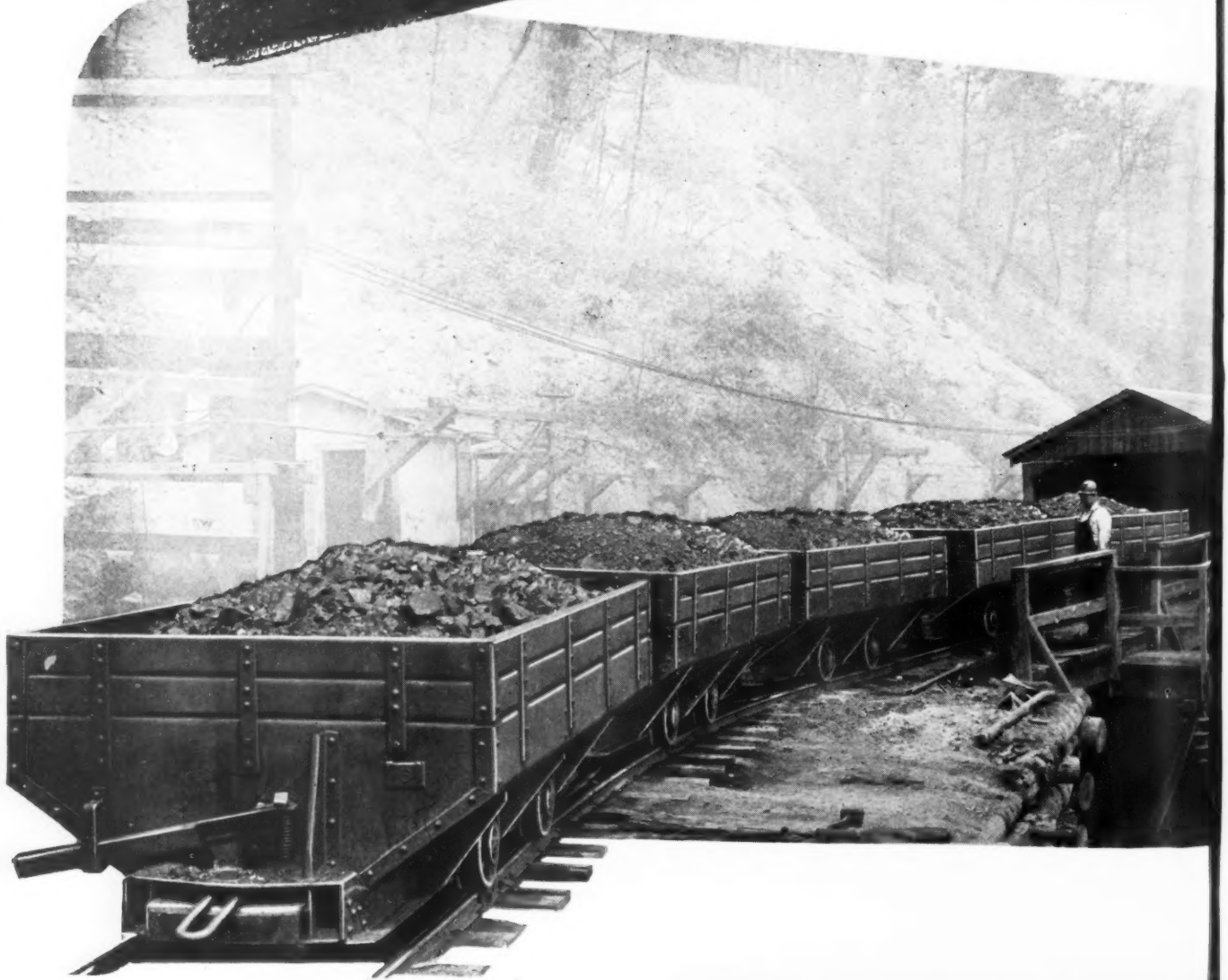
DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

Low Cost



a.c.f.

AMERICAN

NEW YORK · CHICAGO · ST. LOUIS

Haulage

Capacity 312 cubic ft. level full

a.c.f. Automatic Drop Bottom Mine Cars

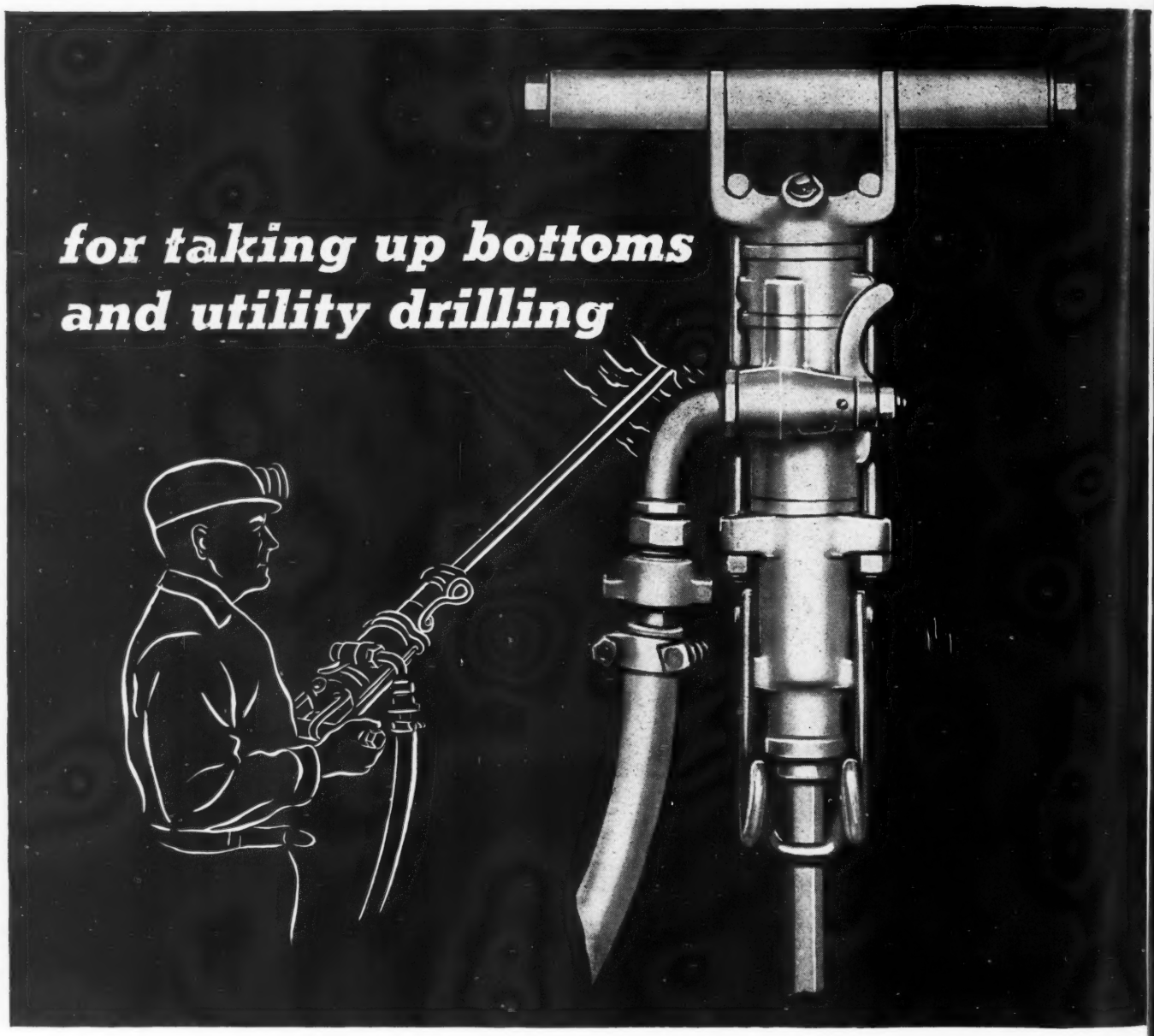
AS THE train passes over the point of unloading, automatic doors on bottom of cars open and coal moves down through the door openings, after which the doors close. This unloading operation is all automatic, smooth in operation and without stopping the train. The cars shown have 312 cu. ft. capacity level full.

Trains of this kind of cars moving without interruption except when they are in the mine long enough to be loaded bring out a lot of coal (a lot of low cost coal).

a.c.f. Chilled Tread Mine Car Wheels, as manufactured under our heat-treating process, are made from a special mixture of metals—better for mine car wheels than steel or iron, alone.

CAR AND FOUNDRY COMPANY

LEVELAND · PHILADELPHIA · BERWICK, PA. · PITTSBURGH · HUNTINGTON, W. VA.



LIGHT-WEIGHT CP-22 SINKER

LIGHT, perfectly balanced and easily operated by one man, the CP-22 Sinker speeds brushing down, taking up bottoms, coal drilling, and general maintenance work. Its high speed, penetrating blow and efficient hole-cleaning substantially reduce drilling time.

Designed for long service and low maintenance, the CP-22 Sinker is fully cushioned and automatically lubricated. Due to its low air consumption, the CP-22 Sinker Drill is ideal for operation with a portable air compressor.

Chicago Pneumatic manufactures a complete line of dependable Sinker Drills, Drifters and Stopers. Write for details.

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TOOL COMPANY

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★★★★★★★★★
AIR COMPRESSORS
VACUUM PUMPS
DIESEL ENGINES
AVIATION ACCESSORIES

Thanks, *Coal Age* for stating our case so well—

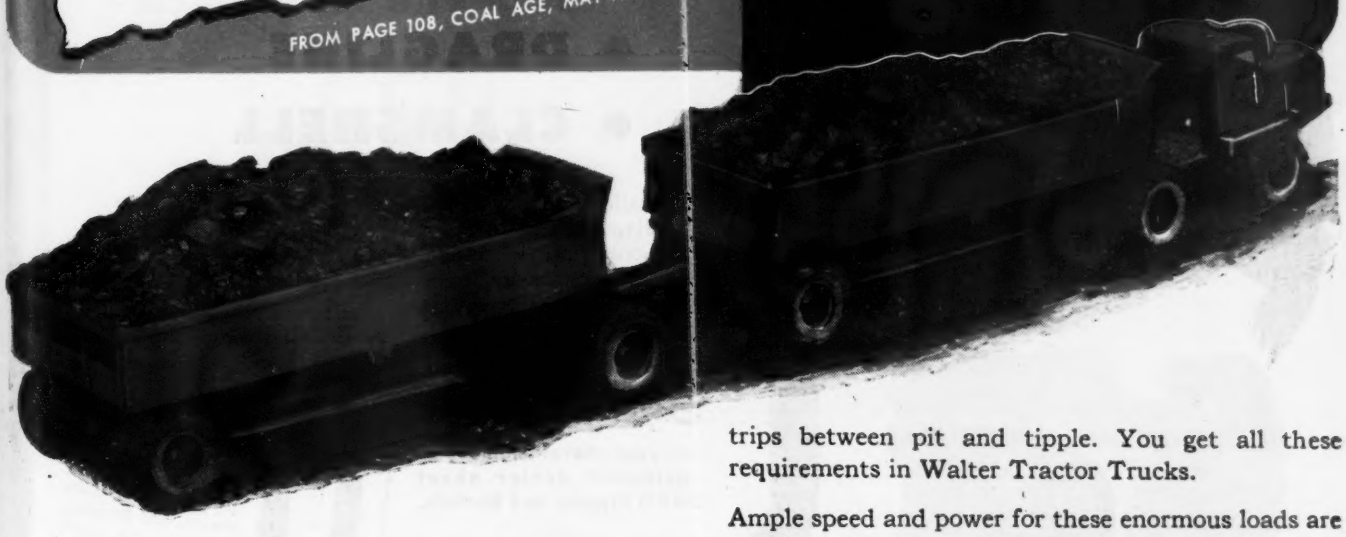
With automotive haulage, as with most other mining activities, increasing the size of the unit results in a corresponding improvement in utilization of mining manpower. Four 40-ton tractor-trailer units, for example, might cost, say $65,000, compared with $80,000 for eight 20-ton units, but the saving in wages for drivers, aside from maintenance and attendance, might total $6,000 to $7,000 a year or more, depending upon number of days worked. Better power units (diesel, butane, etc.), enabling the same equipment to maintain a higher average speed, especially up grades, also promote efficient manpower utilization and save in fuel and maintenance.

FROM PAGE 108, COAL AGE, MAY 1945

. . . but

60 TON PAYLOADS

Reduce Costs **Still** Lower



This is true . . . *providing* you use trucks that can haul these loads fast—that can maneuver easily—that have the traction to navigate severest pit conditions and thus maintain or increase the number of trips between pit and tipple. You get all these requirements in Walter Tractor Trucks.

Ample speed and power for these enormous loads are provided by the 300 H.P. Butane engine, which is converted into maximum tractive force by the unique Walter Four Point Positive Drive. Three automatic locking differentials proportion the power to the FOUR driving wheels according to the traction of each wheel at any instant. There is no wheel slipping on steep grades, soft dirt, mud or slippery surfaces.

The quick, easy maneuverability of the Walter Tractor Truck results from the hydraulic steering and engine-ahead-of-wheels which shortens the wheelbase, reducing the turning radius, and also provides correct weight distribution. Other features of these trucks for low cost coal hauling are described in an illustrated booklet. Write for it.

WALTER MOTOR TRUCK CO., 1001-19 Irving Ave., Ridgewood 27, Queens, L. I., N. Y.

WALTER
TRACTOR TRUCKS

America's most complete line of material handling buckets.

Clamshell
Sizes ½ to 2 yds.

WE BUILD ALL 4

MATERIAL HANDLING BUCKETS

PMCO ALL PURPOSE

- SHOVEL
- PULLSHOVEL
- DRAGLINE
- CLAMSHELL

We build a wider and more complete line of material handling buckets than any other manufacturer. Volume production methods enable us to build a better bucket with amazing economies in manufacturing.

FRONTS, BOTTOMS, SCOOPS, and teeth, shown in red on buckets, are 14% manganese steel developing up to 120,000 tensile p.s.i. for long service life and hard abuse.

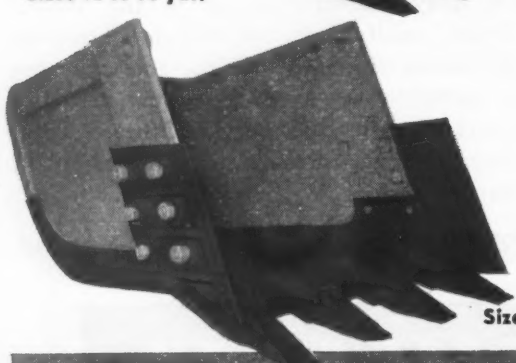
Experience Counts

See your shovel engineer or equipment dealer about PMCO Dippers and Buckets.

On the ½ yd. and ¾ yd. Shovel, Pullshovel, and Dragline Buckets, all teeth are interchangeable . . . a great advantage to operators.

Shovel
Sizes ½ to 18 yds.

Dragline
Sizes ½, ¾, 1, 1½, 2, 2½ yds.



Pullshovel
Sizes ½ and ¾ yd.

Quality Since 1880

PETTIBONE MULLIKEN CORP.

CHICAGO 51, U. S. A.

WE OPERATE THE LARGEST AND MOST COMPLETE MANGANESE STEEL FOUNDRY IN THE UNITED STATES.

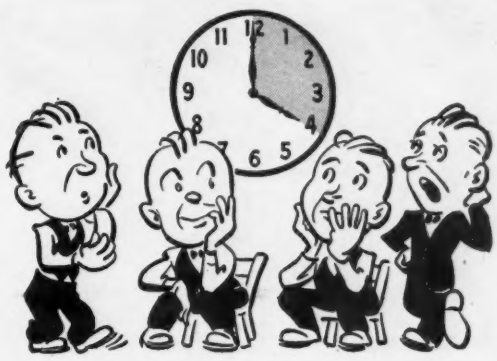
How to cut lubricant leakage and throw-off . . . safely!!

THE PROBLEM of oil leakage from bearings or gear cases, or oil throw-off from rapidly moving parts such as chains or open gears, recurs regularly in practically every plant. The cure is sometimes very simple, such as installing new seals on bearings or gear cases, or using a heavier grade of oil.

But the problem can be complicated, for example, when parts are hard to get, when shut downs to make repairs on machines are out of the question, or where heavier grades of lubricants do not give proper lubrication. In these cases, Stanodrip has solved the problem for many manufacturers.

Excessively heavy lubricants, while they may stop leakage, usually result in overheating, particularly on high speed bearings. Or they may not circulate in gear cases, thus providing little or no lubrication. Stanodrip stops leakage where a regular oil of approximately the same grade will not. Stanodrip contains special additives which resist the tendency to drip or creep, but do not impair its lubricating quality. Let a Standard Oil Lubrication Engineer help you apply Stanodrip to eliminate unsightly, oil consuming, lubricating jobs in your plant. He will be glad to make a test of Stanodrip with you.

How Stanodrip saves lubricant, maintenance, and production time



Saves 4 hours time of 4 operators each month. In a St. Louis plant every clutch failure on a bomb-nosing machine tied up the machine for four hours, losing the time of four operators and costing $80 for replacements. In spite of the fact that a number of lubricants were tried, clutch faces had to be replaced at least twice a month on each of the three machines. It was about decided that there was no way out of the predicament. Then a Standard Lubrication Engineer suggested a test of Stanodrip because of its ability to stay on the plates and reduce wear. As proof that it did, there have been no clutch failures on the three machines in the first two months' operation.

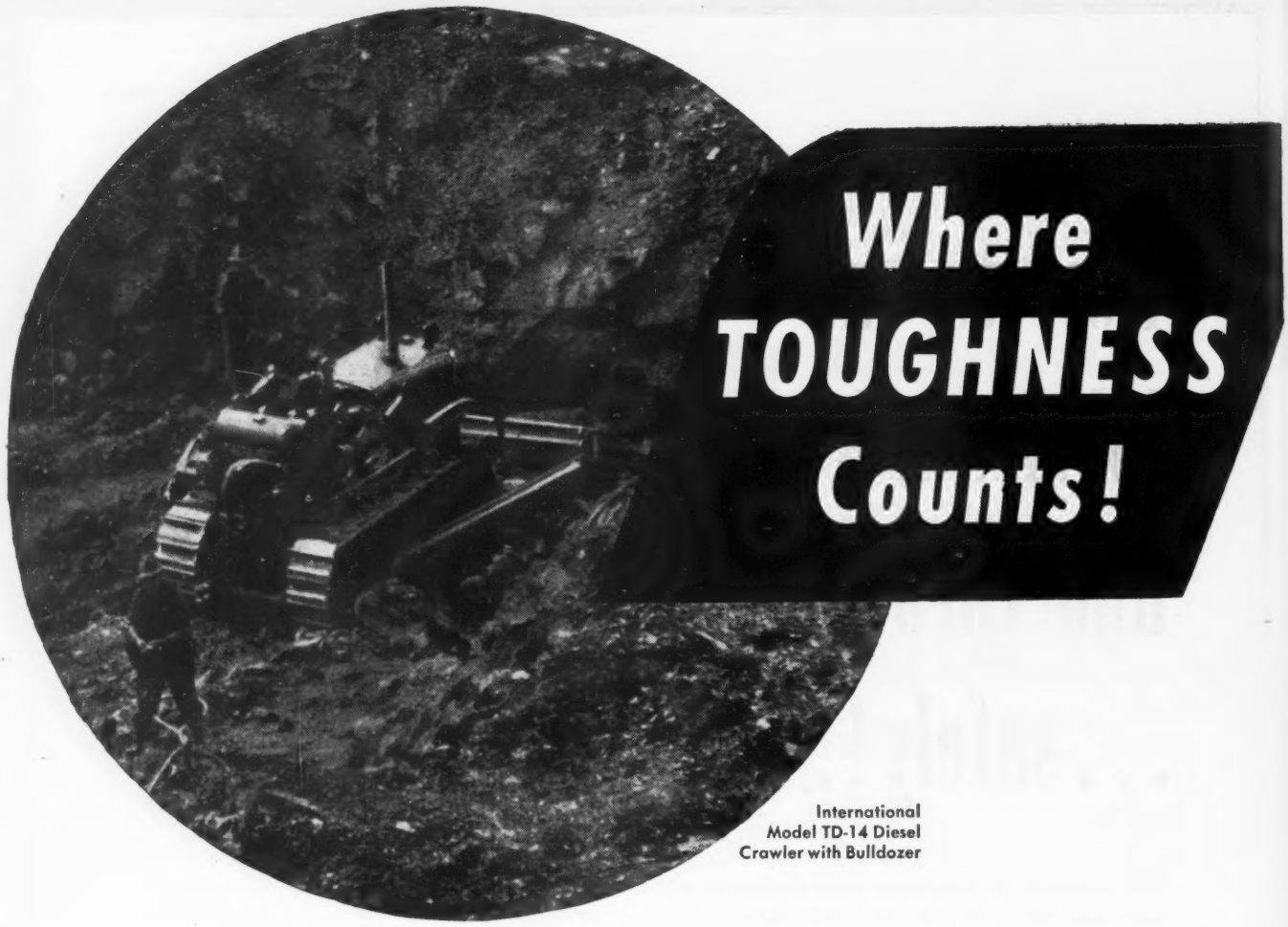
Write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois, for the Engineer nearest you.

Stanodrip

Buy more War Bonds

STANDARD OIL COMPANY (INDIANA) STANDARD SERVICE

LUBRICATION ENGINEERING . . . LUBRICATION ENGINEERING . . . LUBRICATION ENGINEERING . . . LUBRICATION ENGINEERING . . .



International
Model TD-14 Diesel
Crawler with Bulldozer

Strip Mine Operation is a Real Test of Power

•Toughness counts in the strip mines. The terrific hour-after-hour punishment of big bites of overburden and seam is a power endurance test second to none.

On this job International crawlers are tops. They are engineered for toughness to assure service-free operation. International crawlers have the built-in toughness which sees the job through.

International TracTracTors—*full Diesel* or gasoline—are built in four sizes, ranging from the sturdy TD-6 Diesel to the big TD-18 Diesel. Each offers a full measure of performance in its power range.

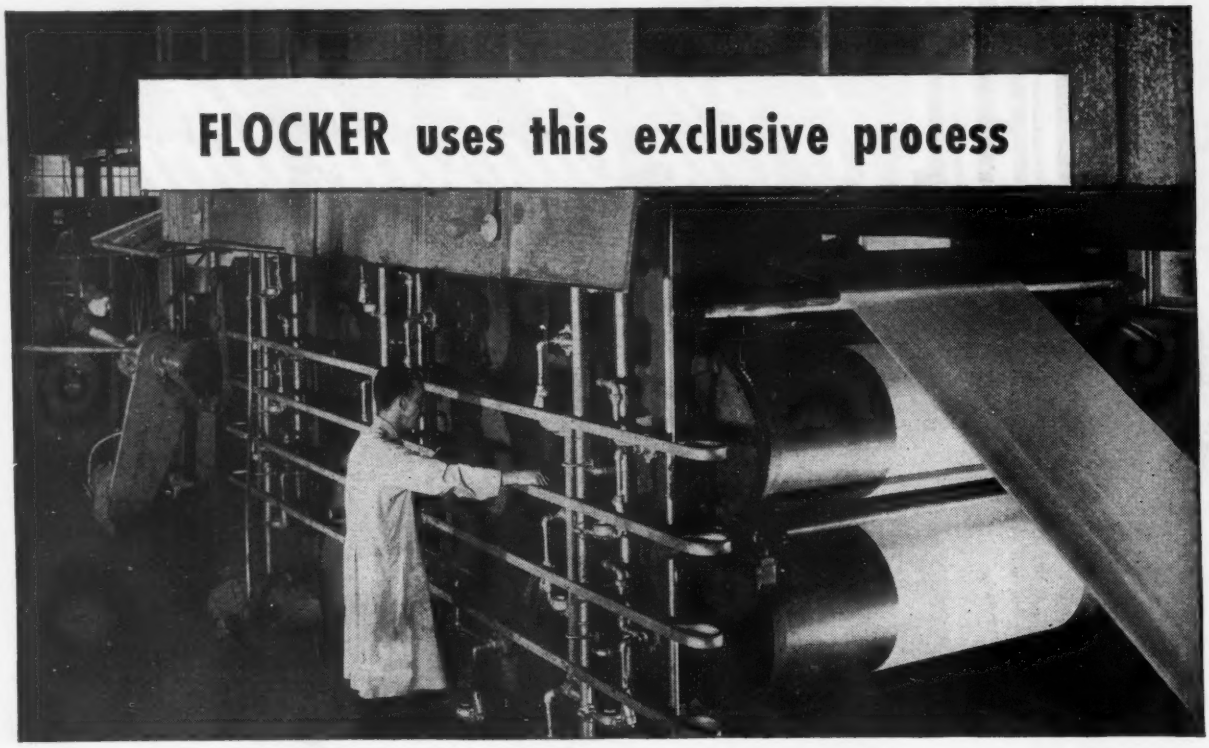
Check your post-war power needs now. See your International Industrial Power distributor for complete information on the power and equipment that will cut your costs. See your International Industrial Power distributor, too, for parts and maintenance.

For your post-war operations, choose the power with built-in toughness—International Power.

INTERNATIONAL HARVESTER COMPANY
180 N. Michigan Ave. Chicago 1, Illinois

INTERNATIONAL HARVESTER

INTERNATIONAL Industrial Power



. . . to give you *better brattice cloth*

Flocker Moropa Brattice Cloth offers greater resistance to fire and mildew . . . stays clean longer and, under identical conditions, outwears the ordinary product.

PROVED SUPERIORITY IN COTTON OR JUTE!

SUPERIOR FIRE-RESISTANCE—Protection lasts almost indefinitely, since chemicals are so thoroughly impregnated that they do not readily leach out.

SUPERIOR MILDEW REPELLENCE—Chemicals used do not absorb excessive moisture and fabric remains relatively dry and repellent to mildew.

STAYS CLEAN—Does not collect mildew "whiskers"—hence no slimy dirt.

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This all-around superiority is achieved through an exclusive chemical process applied to either Jute or Cotton. The fabric is first saturated with special chemicals, then "can-dried"—a process adapted from the textile field—which thoroughly impregnates and bakes fire and mildew resisting properties into every fiber of the material.

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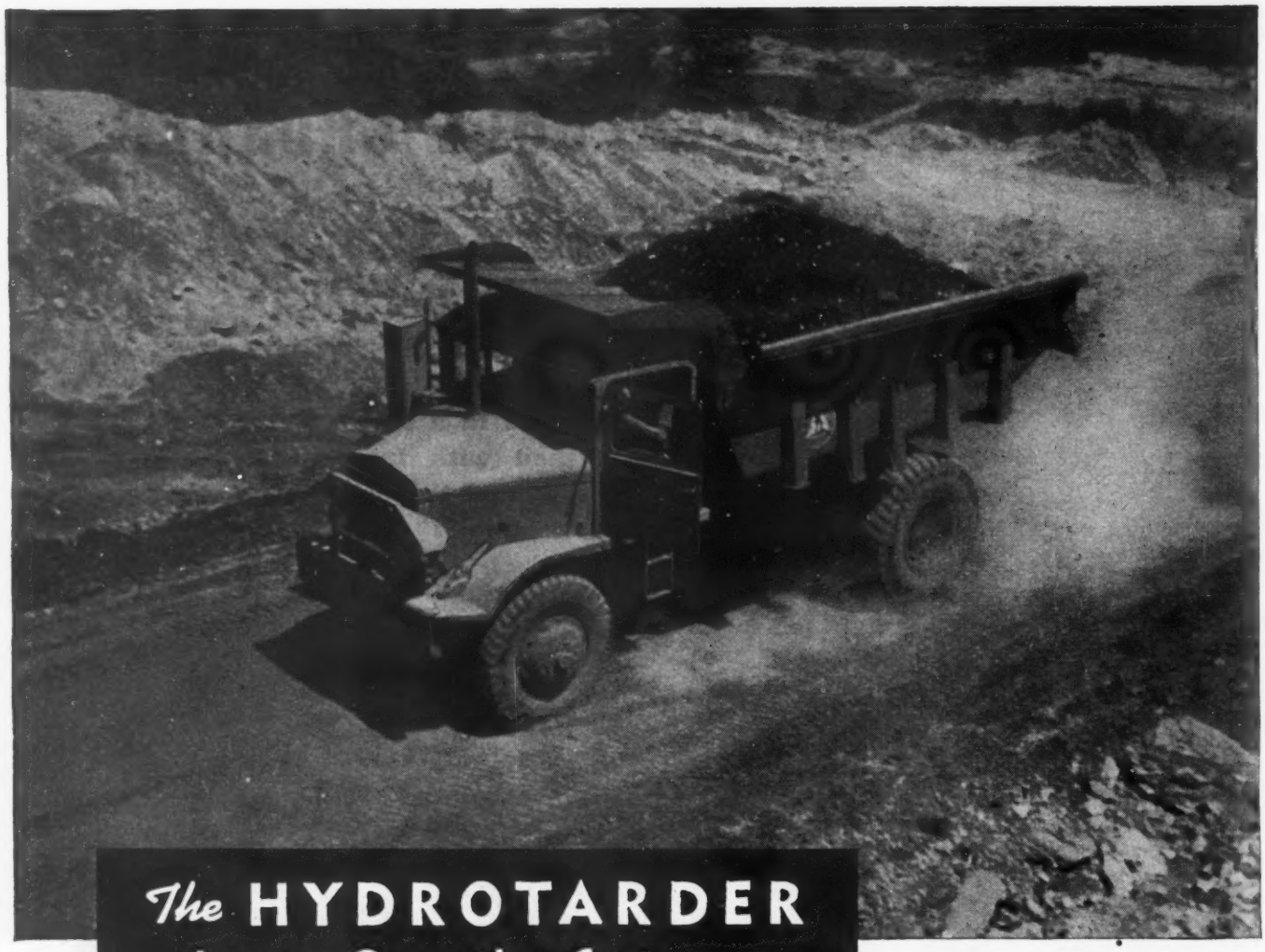

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Lowers Operating Costs - - - Provides Greater Safety, Economy, and Speed

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A truck equipped with a Parkersburg Hydrotarder can descend the steepest grades in perfect safety and without using the mechanical brakes or engine to help control its speed. And because it operates independently of the mechanical brakes the Hydrotarder cannot cause a truck to skid or jack-knife.

In addition to completely solving braking problems, a Parkersburg Hydrotarder will soon pay for itself in savings on fuel, oil, tires, brakes, and engine maintenance. One contract hauler reports 25% saving in tires, 8% saving in fuel, 85% saving in friction brakes and 15% saving in time.

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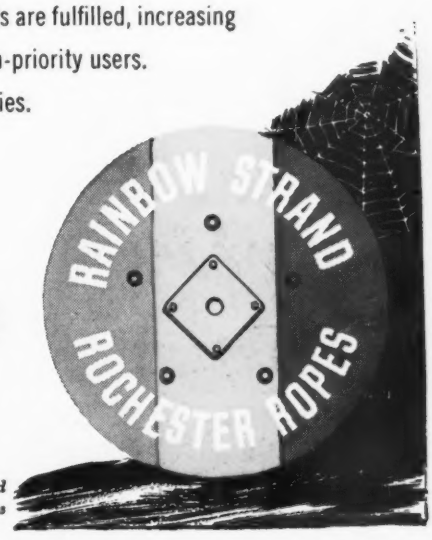

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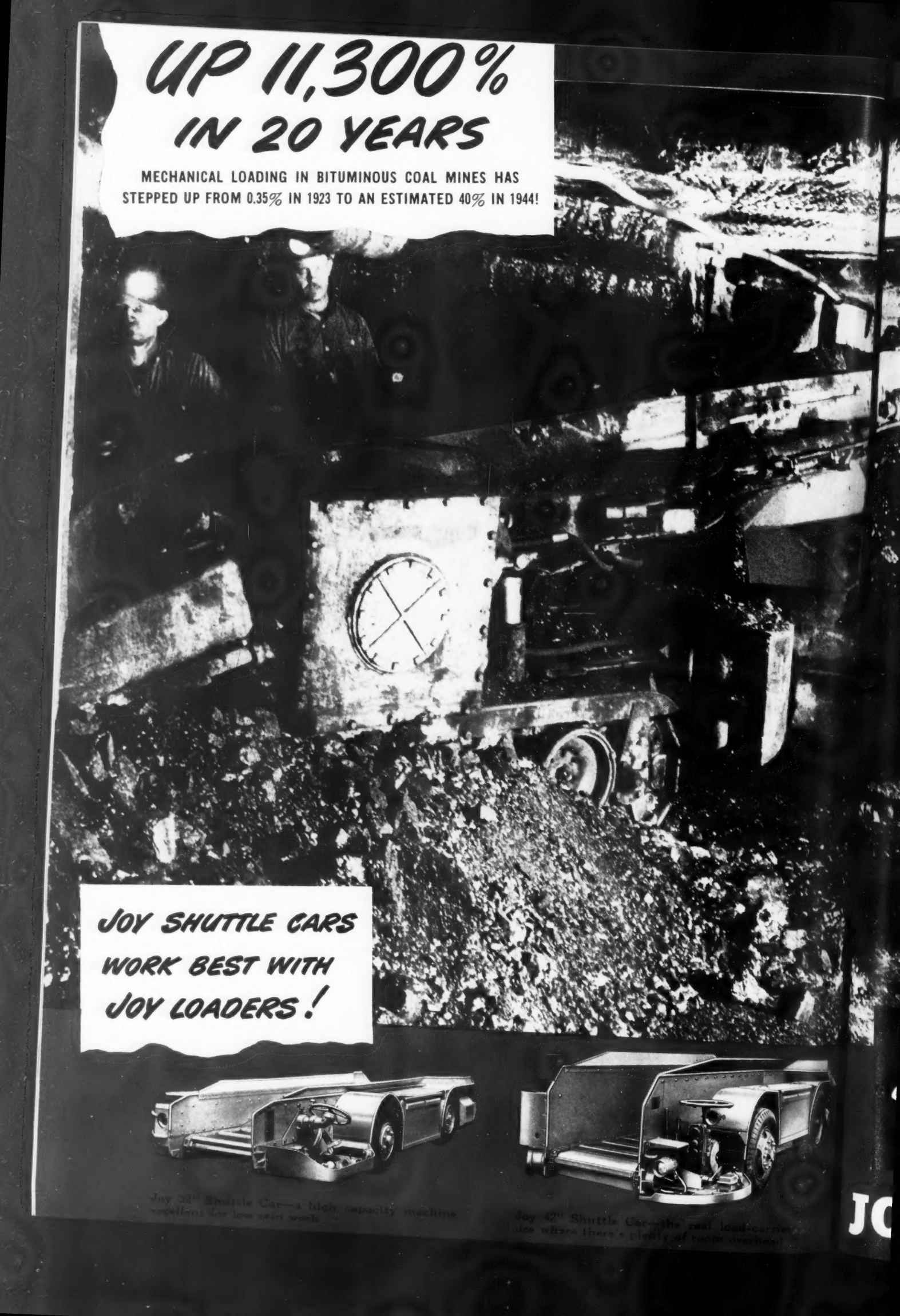

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Joy 32" Shuttle Car—a high capacity machine excellent for low seam work.

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"Almost unanimously the winning mines gave credit to better use of, or addition of, mechanical facilities. Some cited loading machines, some conveyors . . . the word 'mechanizing' appeared over and over again in these reports". . COAL AGE NEWS in summarizing results of their "Coal-For-Victory" awards.

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Coal Age

DEVOTED TO THE OPERATING, TECHNICAL AND BUSINESS PROBLEMS OF THE COAL-MINING INDUSTRY

Ivan A. Given, *Editor*

JULY, 1945

Double by 1950

"CHEAP COAL means cheap miners; it will never exist again!" This philosophy, attributed to Will Lawther, head of the British mine workers' union, perhaps accounts for at least some of the difference in the status of coal mining in Great Britain and the United States. In this country, progress is firmly rooted in the principle that cheap coal—through higher productivity—is the only means of assuring continued prosperity with good wages to miners and reasonable profits to investors.

Cheap coal under the American plan means well-paid men and low cost to the consumer. The added ingredient is increased efficiency in production and preparation. Management usually is thought to have the greater stake in raising efficiency. Actually, it is as important to men as to management. Only by the cooperation of both is it possible to build the foundation of low cost and quality on which good wages and a healthy industry can rest.

Although being said with increasing frequency in recent months, it bears repeating that at the end of the war, or even before, coal can expect intensified competition from substitutes. Low cost still is the best weapon in that battle and that low cost can be secured only through higher productivity. Many operations already are reequipping and modernizing against the day and such reequipment and modernization should be the watchword throughout all the industry—especially in view of recent wage increases. A goal of 10 tons per man-shift in bituminous and 5 tons in anthracite by 1950 may seem like crowding it a bit. But the equipment and methods that could make that goal possible already exist and the closer coal comes to it the closer it will come to clinching its place as the No. 1 source of energy for home and industry.

Final Step?

REALLY satisfying the consumer and winning his steadfast regard—and business—is a matter of many facets. First, there is low cost and high quality, which lie in the province of the operating department. Second, there is merchandising—the responsibility of the sales department. Third, there is research to discover new uses and promote efficiency in existing ones. Fourth, there is presentation of the industry to the public in the correct light, or public relations.

Research and public relations are the newer of the four major steps toward better satisfying the consumer of coal. They are yielding results limited only by the support they receive from the industry. In view of these results, there should be no hesitancy in affiliating on the part of those yet to come in.

Where cost and quality are concerned, intensification of efforts is the keynote, since the principles are well known and need only be applied. Merchandising, however, is yet to be fully explored, in the opinion of many who have studied the subject. There is, for example, the field of technical service, which, to take a leaf from the book of public relations, might be called "technical relations." Such technical relations would round out coal's service by aiding the consumer in finding the coal best suited to his equipment, in finding new equipment better suited to his needs and in burning coal with the maximum efficiency. There is merit in the contention that good merchandising is not really achieved until provision is made for rendering such service.

Still Some Woods

DESPITE growing difficulties aggravated by strikes and stoppages, the coal production record so far this year is better than many expected at the start. But the industry and the country are not yet out of the woods and tighter transportation may be an additional handicap before the books are closed on 1945. All the evidence points to the fact that it is not yet time to let off the pressure.

Ample production, of course, would solve the fuel problem at one simple stroke. Anything that will increase output, therefore, will contribute that much more to a quicker end to the war. But a campaign is again under way to cushion the effects of any gap between production and requirements that might exist next winter. It is insurance and coal—even though its competitors, particularly oil, have not gone along—should be prepared to continue its work in promoting conservation and economical use until the day when supplies are again plentiful. In the long run, such work will pay off in increased respect and public regard.

Helping Coal's Veterans Get a New Start

LONG BEFORE the GI Bill of Rights was passed public opinion had decreed that veterans of World War II should have jobs when they came back if jobs were available. But what the law does not guarantee—what no law can guarantee—is that the veteran can make a success of the job. The law can take him through the plant gate and into the personnel manager's office, but once he reaches the working place, he is on his own. True, the law says that he must be retained a year unless he leaves voluntarily or makes a flop of it. But once the veteran has been rehired, the law has been satisfied. After that he and management must work out their problems together.

Almost everyone who has studied the situation—and there have been hundreds—agrees that three factors must be considered: the veteran, management, and the supervisor. If the veteran is to be happy and successful after he has been rehired, if the company is to receive the full benefit of his services, there must be united effort.

What the veteran's attitude toward his new job will be depends in great measure on what the company's attitude is toward him, and after the first day he will judge that attitude by how he is treated by his foreman and his fellow workers. That puts the matter rather squarely up to the foremen, because while the company can outline policy, it is the foreman who will carry out the policy, watch for the danger signals, adjust the grievances, and guide the newly hired veteran without letting him know about it.

That is the reason so many companies are including the foremen in all their discussions on veterans' matters. They, even more than the veteran himself, are the key to the situation.

Rehiring of veterans in coal mining poses some specialized problems. The nature of the work, where failure to observe specified rules may mean instant damage to life and property, will require more careful and intelligent supervision. The foreman's job will be harder, because a coal-mine section boss can't walk down an assembly line. Readjustment of veterans becomes a reasonably simple matter in a large plant, all under one roof, with elaborate records and the services of a complete medical department, a personnel division, a psychiatrist and a veterans' counsellor at hand. Larger coal companies can afford all those estimable helps, but coal mining is composed of a lot of operations where the personnel division is the foreman and the medical department is a section boss who has studied first aid.

Room For All

The question of the disabled veteran will not be easily solved. Coal mining just does not offer the opportunities for handicapped workers which exist in aviation or some of the lighter manufacturing industries. Yet coal should be able to find a place on the surface, in the offices or the shops for those of its disabled veterans who apply for work.

But if there are detriments, there also are advantages. Coal mining, shorthanded now, should be able to absorb easily all the veterans who apply to it for work. That will eliminate the inevitable embarrassment or resentment when a veteran "bumps" a so-called temporary employee off his job. Things are much the same in coal mining now as they were before the war, so there will not have to be much re-education of men to new methods and new machinery.

Consideration of how best to handle veterans once they have been rehired is not a matter which will wait. Demobilization started with V-E Day, and policies, plans and training courses should be set up now to be ready for the first large influx of veterans. Some companies have already had scattered cases of veterans returning ("Jobs for Veterans," *Coal Age*, October, 1944) and can base future policy on the experience they have gained.

Management in coal mining and in other industries which have investigated the problem believes it breaks down into three major questions:

1. What can management reasonably expect the veteran to be like?
2. What can management do to prepare for his return?
3. What can the foreman do to help him once he is back on the job?

Of necessity some portion of the answers must be conjecture, since neither industry nor government has been able to assemble sufficient case histories to establish anything more than general patterns. But that evidence, combined with studies by personnel experts throughout the nation, has led to conclusions sufficiently accurate to provide a reliable guide for coal-mining companies, large or small, and their supervisory staffs.

(*Continued on page* 80)

Thousands of ex-service men soon will be returning to coal mining, bringing with them both problems and opportunity. How can management help best in making their readjustment both quick and easy? Sound planning is needed now, but the biggest part of the job in getting the veteran off on the right foot falls on the supervisor.

BACK TO WORK comes GI Joe, represented here by Ray Goad, of Pocahontas, W. Va., veteran of 16 months with the Marines in the South Pacific. Thousands of Ray Goads soon will be bringing their hopes, fears and ambitions back to coal mining. Management must supply them with more than a job. It must furnish the help they will need in becoming readjusted to civilian life.

What the Returning Veteran Is and Isn't

IN TALKING ABOUT the returning veteran himself, both government and industry authorities agree that the negative side of the question is less understood than the positive, that industry needs to learn more about what the veteran isn't rather than what he is. In other words, a little debunking seems to be in order.

Some false impressions have arisen, particularly about disabled veterans, and here, at least, the facts and figures of the Surgeon General's Office of the War Department can supply the proof. Here it is:

Discharges: No soldier is discharged from an Army hospital until he has reached a stage of "maximum improvement," or, in the layman's language, until he has been cured or cured to the extent his disability will permit. His medical record does not show on his discharge, of which there are three types: white, blue and yellow. White is honorable, blue means simply that he has severed his connection with the service for one of many reasons, and yellow is dishonorable. The company may require any veteran to undergo a physical examination. If the company's findings and the veteran's opinion disagree, the veteran has the right of appeal. The company, however, may not obtain a record of the veteran's service medical history without the veteran's consent.

Surgical Cases: Many civilians entered the armed services suffering from unsuspected ailments often aggravated by service duties. Many men underwent operations for hernia, intestinal and digestive disorders with hospitalization and surgical attention which in civilian life they never would have been able to afford. Many were subsequently discharged. These men, normally speaking, are coming out of the armed forces in much better physical condition than when they entered them.

Amputations: There are nowhere near as many of these as some loose talk has led people to suspect. In fact the Surgeon General's Office says that as of May 1, about 11,000 cases were being or had been treated in Army hospitals in the United States. Six Army centers specialize in amputation cases. The men are given long courses in physiotherapy, are fitted with the best custom-made artificial limbs, and are not discharged until they have mastered their use.

Mental Cases: These are the great bugaboo of the veteran situation, greatly overemphasized and generally misunderstood. Most combat veterans will be a little "different," but that does not mean that they will be mental cases. There will be nothing wrong with them that a few months

Getting Man and Job Together

WELCOME HOME. Foreman Harry Hall greets Marine PFC Emery Newkirk, coming to ask about getting his old job back.

EMERY NEWKIRK returned to coal mining at Dakota, W. Va., after serving through four major engagements with the Marines and being slightly wounded four times. What happened to Newkirk when he went back to his old company may not be typical of what will happen to all returning veterans, but the situation is typical.

Before the veteran arrives, progressive management will have mapped an enlightened over-all policy for placing him back on the payroll and doing everything possible to help him become adjusted quickly to civilian life. A vital part of such policy, students of the problem declare, is to see that all supervisors who will come in contact with veterans are familiar with it, perhaps even have had a voice in framing it. Included in the policy also will be a thorough inventory of jobs which veterans can fill (including those for handicapped persons) as well as jobs which will be open for any present employees whom veterans might displace.

The company either will have hired a full-time veterans' counsellor or else designated a well qualified supervisor to act in that capacity, preferably a veteran himself. It will have seen to it that both executive management and supervisory management are fully acquainted with the laws dealing with veterans' preference and benefits. If at all possible, executive management will have had a doctor or a psychiatrist or both lecture to supervisors on what to watch for in returning veterans to help the supervisor spot the danger signals of either mental or physical illness.

When the veteran arrives, executive management naturally will make its welcome cordial and sincere. It will make sure, after the veteran has gone to work, that periodic reports are received on his progress, and the foreman's

of normal civilian life will not cure. But the veteran's normal peculiarities may easily be inflated and misunderstood because people will be watching for them. Of 100 cases of battle fatigue, between 70 and 80 normally are treated without ever leaving the combat zone. These generally are cases of nothing more than complete physical or emotional exhaustion. They are "pooped," and rest and quiet effect the cure. Of the others, between 5 and 10 percent require treatment in rest centers farther from the combat zone and are returned either to combat or other army duties. About 15 percent are sent back to the United States for further treatment. "Almost all" of them, the Surgeon General's Office says, are either discharged as cured or else are cured and reassigned to other army duties. The rest, of course, are advanced mental cases and must be hospitalized for extended treatment. Many men were rejected for the armed forces because of mental unfitness. Some of those just would not fit in anywhere. Others were fit in civilian life but were found unfit for army duty, upon being examined.

The veteran who, after being given every possible consideration, turns out to be a persistent trouble-maker, nine times out of ten would have been a trouble-maker whether he was a veteran or not.

The medical departments of the armed forces in this war have done a magnificent job of rehabilitation of battle casualties and of control of disease. Any employer can rely on the fact that a man discharged from the armed services is as physically ready to take up his civilian duties as the best medical care in the world can make him.

Management: Planner and Friend

The GI Bill of Rights says that employers must provide a returning veteran with his old job or with a comparable one unless to do so is "impossible or unreasonable." What the law does not say is that management should get ready now to be sure it is in a position to provide such jobs with the least possible disturbance to its present payroll and with the greatest possible benefit to the returning veteran.

Ideally, those two objectives would be accomplished through the combined efforts of the personnel division, the medical department, the veteran's counsellor, and advisory placement committee and a course in specialized foreman's training. Some coal companies will be able to afford to do all that. Others must depend on their own ingenuity, on group activity and on their own conscience as to how far they think they can go in helping the veteran become adjusted. But there are a number of things which all companies, large or small, can do to make the veteran's return happy, profitable and permanent. In the following pictures and text, *Coal Age* shows some of those things by following a returned veteran from the time he applies for employment until he draws his first week's pay.

Mine Name NO.7
Date 4-12-45
Foreman AL SPIVAK

JOB INVENTORY

Veteran's Name	When Entered Service	Last Job With Co.	Present Rank and Duties	Will He Want Old Job Back?	Successor's Name	Work Record	Will He Want to Stay
LOUIS PRESTON	6-18-43	LOADER	U.S.M.C. PFC AIR GROUND FORCE MECHANIC	HAS TOLD PARENTS INTENDS TO RETURN	BILL LESLIE	GOOD	58 YEARS OLD, DOUBTFUL WILL WANT TO STAY
FRANK GRAHAM	8-13-42	MECHANIC	CAPT. INFANTRY MACHINE GUN OUTFIT - IN EUROPE	DOUBTFUL - HAS TOLD FRIENDS WANTS TO OPEN GARAGE	JACK KING	EXCELLENT	GOOD MAN, STEADY WORKER, SHOULD BE RETAINED
PHILIP SLOCUM	3-21-44	TRACK LAYER	PVT. INFANTRY LOST RT. LEG	WANTS JOB IF HE CAN FILL IT	BOB KNIGHT	FAIR	NO OPINION - COULD EASILY BE REPLACED
GEORGE McCARTHY	3-20-41	DRILLER	T/S - INSTRUCTOR, ARMORED FORCE	NO DATA - POSSIBLE FOREMAN MATERIAL	JACOB HARRIS	POOR	BAD HEALTH - WILL QUIT AT FIRST CHANCE
BERT JOHNSON	7-8-43	TIMBERMAN	CPL. ANTI-TANK UNIT - SLIGHTLY	TOLD CO-PAPER EDITOR LOOKING	ERNEST WELLS	EXCELLENT	WANTS TO STAY - GOOD MAN - SEE

GETTING THE FACTS. Management will find some of its problems easier if before veterans arrive in any numbers, a survey is taken, not only of jobs open to them but those available to men already employed.

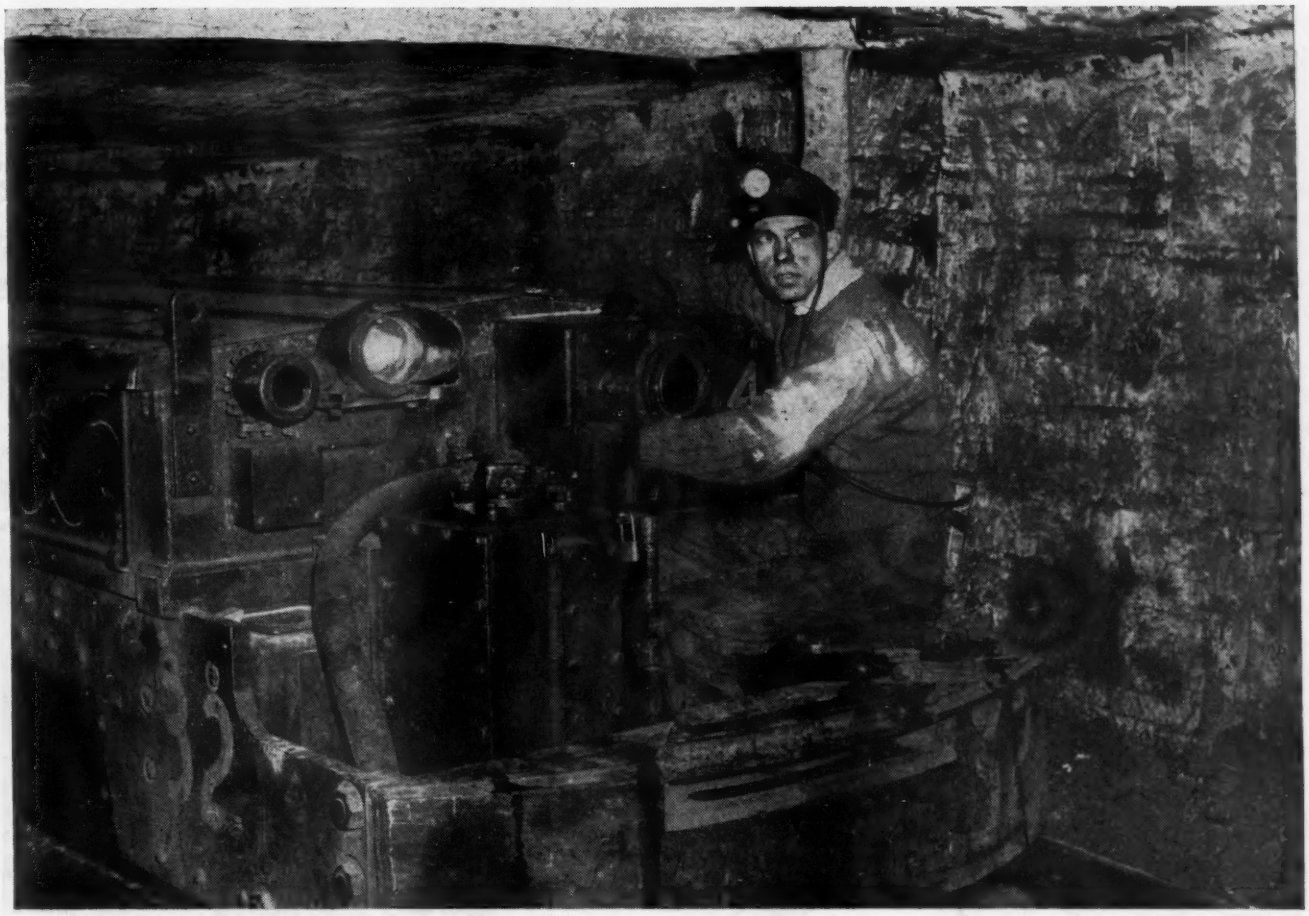
recommendations followed wherever possible on changes.

That is about all top management can do. It can lay out the policy and provide the job. From then on, it is up to the supervisor. He will be the man the veteran sees every day on the job. It will be his responsibility to see that the veteran fits into that job, that his fellow workers are instructed on how to act toward the veteran, that the veteran receives every break, but no special favors.

But the supervisor's job is not as formidable as it might seem. The first requirement is that he be backed up by a clear and progressive policy so that he has to make fewer difficult decisions himself. The next requirement is that he receive some special training in dealing with veterans. After that, helping the veteran become readjusted quickly and easily to civilian life becomes just another specialized job of human relations. The tested methods of patience, tact, watchfulness and understanding which the good supervisor has already acquired will be just as valuable tools in his relations with veterans as they have been in his relations with other employees.

TALKING IT OVER is one of the first and most important steps the supervisor must take when the veteran reports for work. If the veteran formerly worked with the supervisor, they will want to get reacquainted. If he is a new man, they will want to get to know each other. In addition, a friendly, informal chat often will uncover skills the veteran learned in the armed forces, qualify him for a better job than the one he left. Here Foreman Hall checks with Newkirk and signs him on as a motorman.

FIRST DAY ON THE JOB may make or break a returning veteran and part of the foreman's task is to instruct his men how to act. Best policy is to tell them to be friendly, but not sentimental; cordial but not inquisitive, and if the veteran happens to be a wounded man, not to stare at his disability. Newkirk's old buddies greet him here as he reports for work. Cardinal point to remember for supervisors handling veterans is that all experts (and veterans themselves) agree that the thing they want most is to be treated just like anyone else, not set aside as a curiosity or a special exhibit.



A BATTERY LOCOMOTIVE becomes Newkirk's charge as he gets back into his mining harness. One of the supervisor's first and most important tasks is to see that returning veterans are placed in compatible jobs where they can use maximum ability. Effective help in placing the right man in the right job is a thorough job inventory which shows work available for returning veterans and present employees. Fortunately, Newkirk came back in good physical condition. All veterans will not, and coal mining has obligations to them, too. While opportunities in coal mining for handicapped workers are limited, job inventory may reveal a surprising number. Getting all facts together before veterans return will simplify task of placing them both for top management and supervisors.

FIRST DAY'S WORK DONE, Newkirk turns in his lamp. Competent supervisors realize that their task in helping to readjust veterans does not end with the first day or two they are at work. One of the most important jobs will be a constant but unobtrusive check on the veteran's work and how readily he is adjusting himself to it. Veterans who have been through combat, for instance, may show signs of nervousness when shots are set off. This will disappear, but perhaps a change to some other job for a brief period will overcome it quicker. The first few weeks on the job are when the supervisor must keep his eyes open for signs of excessive fatigue, the "blues," a tendency toward "hell raising," dizziness and other danger signals, and be quick to recommend changes in work for veterans who will benefit by them. Part of management's responsibility is to see that such reports are made frequently and to take appropriate action promptly.

PAY DAY is a great morale builder, and Newkirk has just collected his wages as a motorman, a job which averages him about $60 a week. Part of supervisor's task will be to encourage veterans to upgrade themselves as workers, either through off-hour study or through regular training classes. Many of them will return with a high degree of skill acquired in a mechanized war, with a knack both for receiving and understanding instructions quickly and for giving them clearly. Training courses may uncover much valuable supervisory material among returned veterans.

ALL VETERANS, like most everyone else, will want to blow off steam now and then, and one of the best ways management and the community can help is to provide wholesome places for entertainment. Here Mr. and Mrs. Newkirk cut a mean rug at the Saturday night dance at a local lodge hall. One of the best ways of helping the veteran become readjusted to civilian life is to encourage him to assume a responsible place in the community. The veteran will benefit by acquiring new interests, and the community will benefit because the veteran will bring a new and fresh point of view to community affairs.

SATURDAY NIGHT DINNER at home with his family is something Newkirk has looked forward to for a long time. Married for 11 years, he is the father of three children, but many veterans will lack the steadying influence of home and family when they return. No supervisor is expected to "wet-nurse" men under him, but they should bear in mind that returning veterans without strong home ties probably will require closer supervision, more frequent counsel, and friendlier advice than those with family responsibilities. Alert supervisors know that worry often makes inefficient workers.

How to Help the Veteran Become Part of the Team

Supervisors will find their task of handling veterans on the job considerably easier if they remember to follow a few simple rules devised by experts who have studied the question. In addition, they should instruct their men to follow much the same rules. For instance:

DO

- be patient
- be sympathetic
- be cordial
- be specific and complete in giving instructions
- let him talk when he has a problem
- keep an eye on him without letting him know it
- give him an occasional pat on the back for good work
- try to find out his hopes and ambitions

DON'T

- be curious
- be sentimental
- accord him special privileges
- stare if he is a disabled man
- try to make him talk about the war
- try to be a doctor
- bawl him out before the other men
- treat him differently from any other worker

Danger Signals!

Watch out for them in the veterans that come back to work. If you spot them, have a friendly talk with the veteran about it. If they persist, report to your superior, and company policy will indicate the next step to take.

EXCESSIVE FATIGUE—perhaps the man is not strong enough yet to do the job to which he has been assigned. Talk over possibility of transfer to some other work.

FREQUENT HEADACHES—may indicate worry, or perhaps unsuspected eyestrain. Better consult the medical department.

DIZZY SPELLS—might result in a serious accident. Frequently the result of stomach trouble. Better tell him to see his doctor.

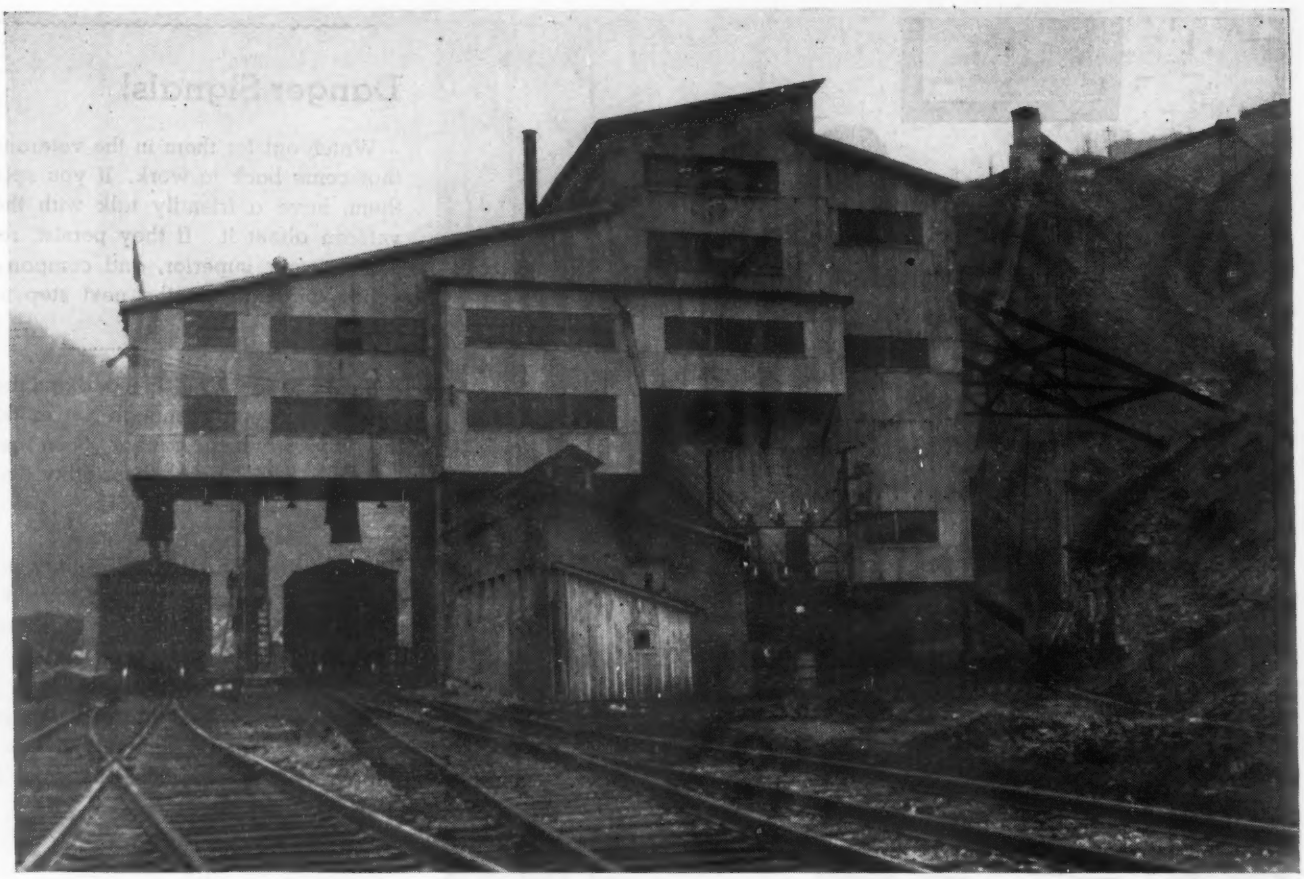
NAUSEA — may be either from nervousness or from actual sickness. In any case, don't kid him about it; sympathize, send him home and tell him to get some medical advice.

IRRITABILITY — sometimes the result of a physical ailment, but more often dissatisfaction or worry. A friendly talk will often help more than anything else.

THE BLUES—often a result of lack of confidence. Perhaps the job is not suitable, perhaps the man can do a better job some other place. Check up on his work and talk it over with him.

HORSEPLAY — sometimes the result of restlessness, a desire "to start something around here." Impress on him the need for safety, if not only for himself also for his fellow workers.

MOODS—many veterans will have them, just as other people have them but perhaps do not show them as much. Be patient, try to get to the source of the trouble. Discouragement may account for some moods. A pat on the back will often help.



Republic-mine preparation plant with headhouse in the background. The 4½x0-in. mechanically cleaned product is loaded on the two tracks at the left.

NEW REPUBLIC MINE

Produces and Prepares Coal Mechanically

Planned for Complete Mechanical Operation and Pillar Recovery, Republic Mine Uses Loading Machines, Shuttle Cars and Belts Underground With Wet and Dry Cleaning of Coal on the Surface

By J. H. EDWARDS
Associate Editor, Coal Age

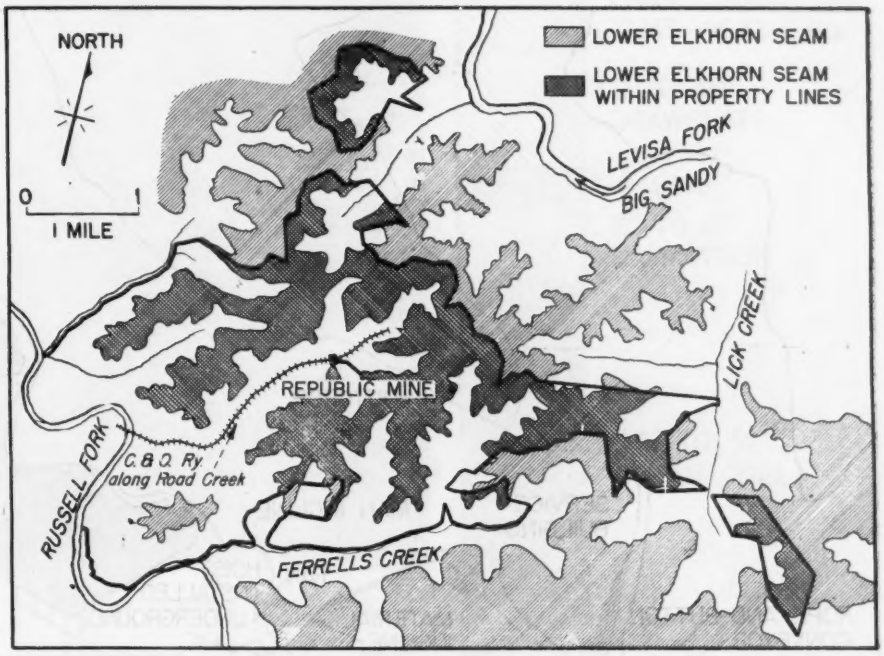
MOBILE LOADERS, shuttle cars and belts handle loading and transportation at the new Republic mine, at the head of Road Creek off Russell Fork of the Big Sandy River in Pike County, Kentucky. This mine, opened by the Republic Steel Corp. to supply byproduct coal to the company's mills, is the first in that county planned for 100-percent mechanical loading and complete extraction of pillars. Belts are not used for carrying supplies nor are men allowed to ride on them. Tracks for trolley-type supply locomotives, with bridges across belts, are installed to carry men and materials to all sections.

The mine is in the Lower Elkhorn seam, which includes a 48- to 52-in. stratum of clean coal. Shipping run-of-mine coal began June 15, 1943; washed coal, Sept. 20. Now, 12,000 ft. of belt is in use underground, 2½ miles of six-heading entries have been driven, pillars have been robbed in three crop sections and the daily production is 1,800 tons of washed coal. In planning the mine and in its operation, safety has been kept in the foreground. From September, 1944, to March 15, 1945 (the time of this writing), only two lost-time accidents occurred.

Republic mine is served by the Chesapeake & Ohio Ry. A bridge was constructed across Russell Fork of the Big Sandy River connecting to a 3.1-mile extension of the railroad to the tipple on Road Creek. The yard tracks will accommodate 48 70-ton cars. The extension was completed in June, 1943. Highway distance from Pikeville to the site of the mine office and tipple is 20 miles, 17½ miles of

which is paved road and 2½ unimproved but passable creek road. Elevation of the coal seam at the belt portal is 1,487 ft. and of the railroad tracks at the tipple, 1,063 ft.

The seam lies practically level. Grades in local dips seldom exceed 2 percent. The property, owned in fee and including approximately 5,000 acres of the lower Elkhorn coal, consists for the most part of one area of numerous connected fingers of irregular shapes. Cover reaches 450 ft. The Upper Elkhorn seam, not commercially minable in this locality, lies 180 ft. above the lower seam.



Property lines and seam outcrops, Republic mine.

Coal Left in Bottom

Seam thickness is 66 in. and all of it is taken except that 2 to 4 in. of coal is left in the bottom. The mining includes a laminated coal-and-bone streak 8 to 10 in. thick and 4 in. down from the top. Above that, in most places, is a drawslate up to 30 in. thick, all of which is taken down in entries and part of which is held when slabbing and extracting pillars. Over the drawslate is a frail sandstone which disintegrates and flakes down in warm weather.

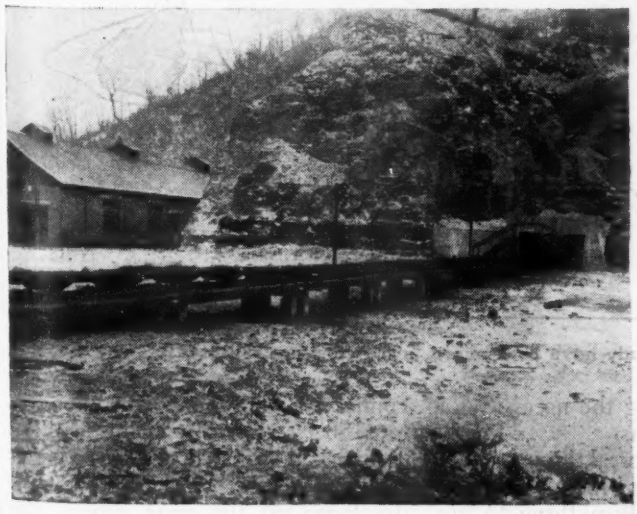
The bottom is 1½ to 4 in. of soft fireclay on 5 to 8 in. of bone coal. Below that is 12 to 14 in. of fireclay. Some water is present and in those spots wooden roads have to be laid for the rubber-tired shuttle cars. The coal is high-volatile byproduct grade of about 3½ percent inherent ash. In the headhouse, all of the output is crushed to a 4½-in. top size.

The following list of equipment indicates in part the underground methods: five shortwall cutters with 9-ft. bars using standard chains and plain forged bits; one shortwall with 6-ft. bar; six hand-held electric coal drills (of the cutters and drills, four of each are in regular use); four crawler-type cable-reel trucks for carrying shortwalls; four crawler-mounted rubber-suspended loaders; four 3-ton cable-reel shuttle cars; four 3-ton storage-battery shuttle cars; 12,000 ft. of 30-in. belt conveyors with one 40-hp. a.c. drive in the headhouse and four 40-hp. drives underground.

Auxiliary equipment that should be included in the list is as follows: two 8-ton cable-reel locomotives for hauling men and materials; three 60-g.p.m. self-priming centrifugal pumps; one 30-g.p.m. pump of the same type; one rock-duster with two sets of trucks (one for track and the other a steering-type unit for rubber-tired wheels). All of the underground equipment operates on 275 volts d.c.

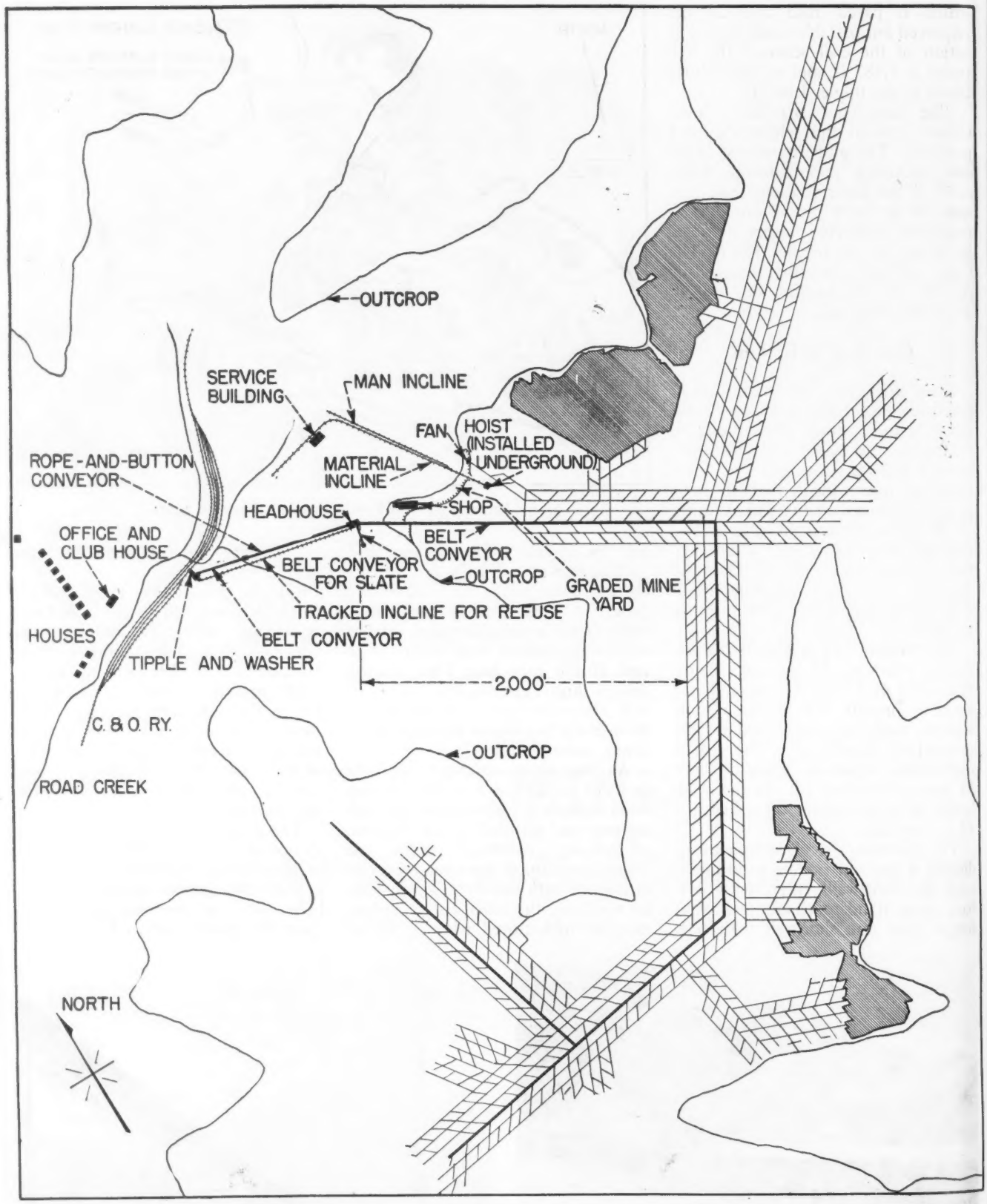
On the main entry (six headings) the belt is installed in the right-hand one of the center pair. On branch entries (also six headings) turned to right the belt is in the left-hand one of the center pair and on entries turned to the left in the right-hand heading. With that arrangement two branch belts working in territories on opposite sides of the main belt can discharge at one point so that one conveyor operator can tend both.

The principal reason for employing an operator at each point where a side or branch belt discharges to another is that drawslate is handled on the belts. To keep from mixing coal and slate, the operator, when he sees slate



This first section of the 30-in. underground belt system delivers 300 ft. beyond the portal to the headhouse. The building is the mine shop.

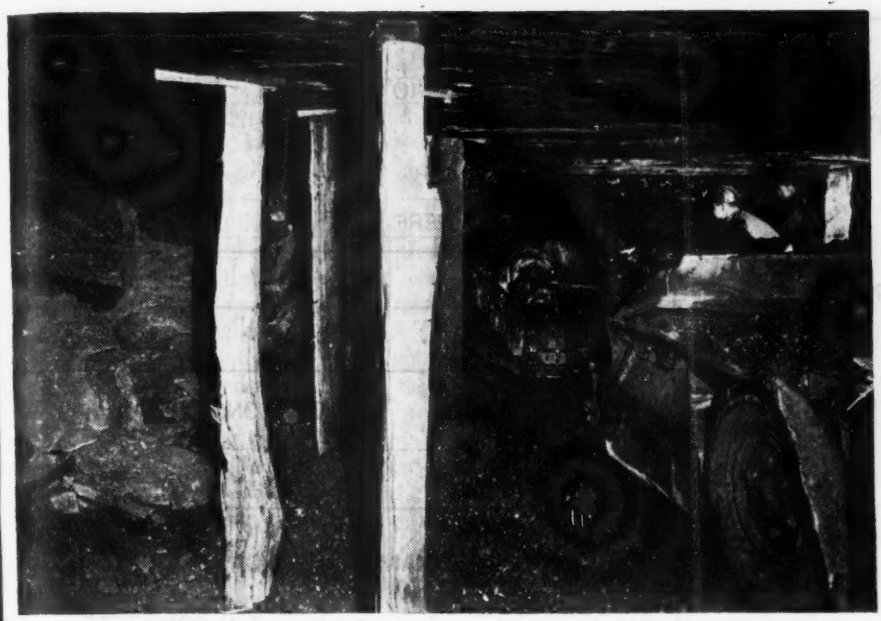
Looking up to the headhouse and refuse belt from the preparation plant. The mine portal is 424 ft. higher. The mast at the left supports a car retarder.



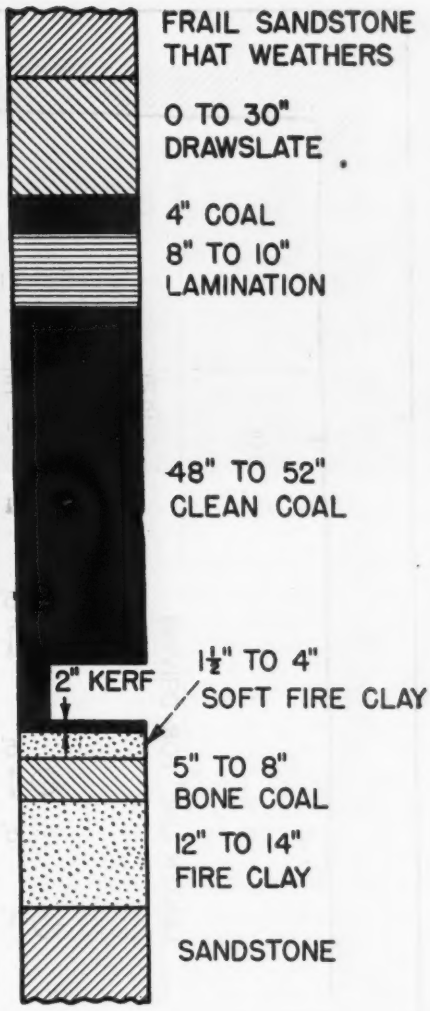
Initial development in Republic mine. Pillars already have been mined in the cross-hatched area.

coming on the branch belt, stops it unless at that time the main belt is running empty of coal. Another reason for his being there is to save damage to belting in case an extra large piece of slate hangs up at the transfer point. Incidentally, having belt operators simplifies the electric controls by obviating the necessity for sequence connections.

Headings and breakthroughs are driven 12 ft. wide and rooms 16 ft., all on 80-ft. centers. Breakthroughs are turned at 60 deg. every 85 ft. between the center pair of headings and the same between outside pairs. Those connecting the three pairs, however, are 170 ft. apart but in line with the ones first mentioned. Entry pillars are diamond-shaped blocks. Rooms are developed on the same general plan but with all breakthroughs driven straight on through, thus making uniform diamond-shaped pillars.



Taking an open-sided cut next to the fracture line from a diamond-shaped pillar.

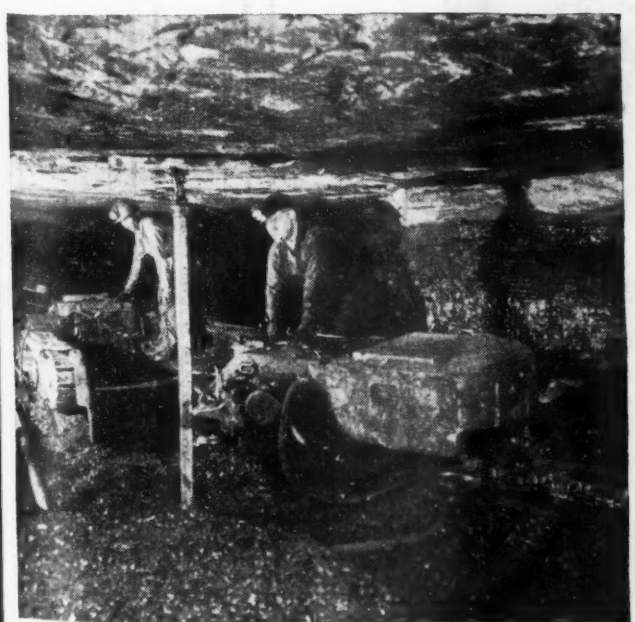


Section of the Lower Elkhorn seam in Republic mine.

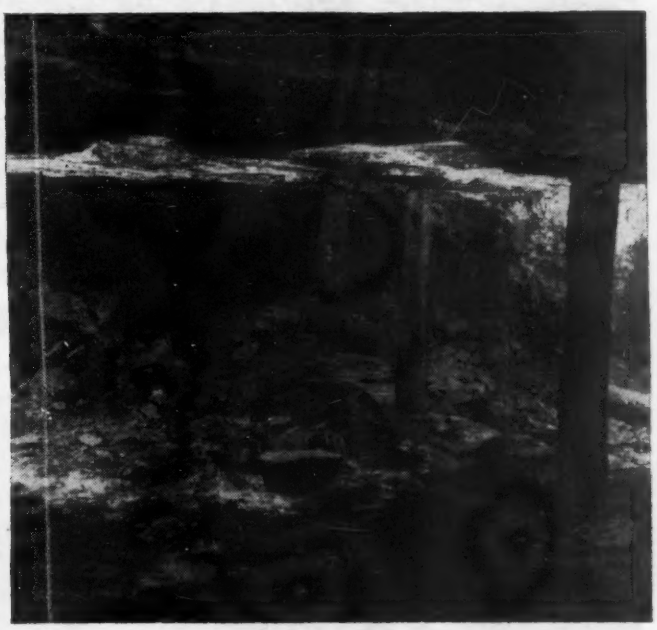
Shuttle cars dump directly to the belts, some to the ends and some to the sides. It is the plan to limit shuttle-car hauls to 400 ft., but, because of slow deliveries of pans and belting for extending conveyors, the cars have hauled coal 1,100 ft. To accomplish hauls up to 1,000 ft. with cable reels that spool but 500 ft., the nip is attached to the power at a midway point and back spooling is practiced. One battery and one cable reel car serve each loader.

Thirteen men comprise a unit crew. There are two men each for the drilling, cutting, loading, shuttle-car operating and slate work. That accounts for ten. A shotfireman, a timberman and a road man make up the remainder. The road man cleans up at points where the shuttle cars dump to belts and works the shuttle-car roadways. The slate men clean the working places after the loader and preparatory to entrance of the cutting machine. Also, after the shot, they remove and gob the drawslate that has come down or is loose. In addition they look after drawslate on the roadways and sometimes help build wooden runways through wet places.

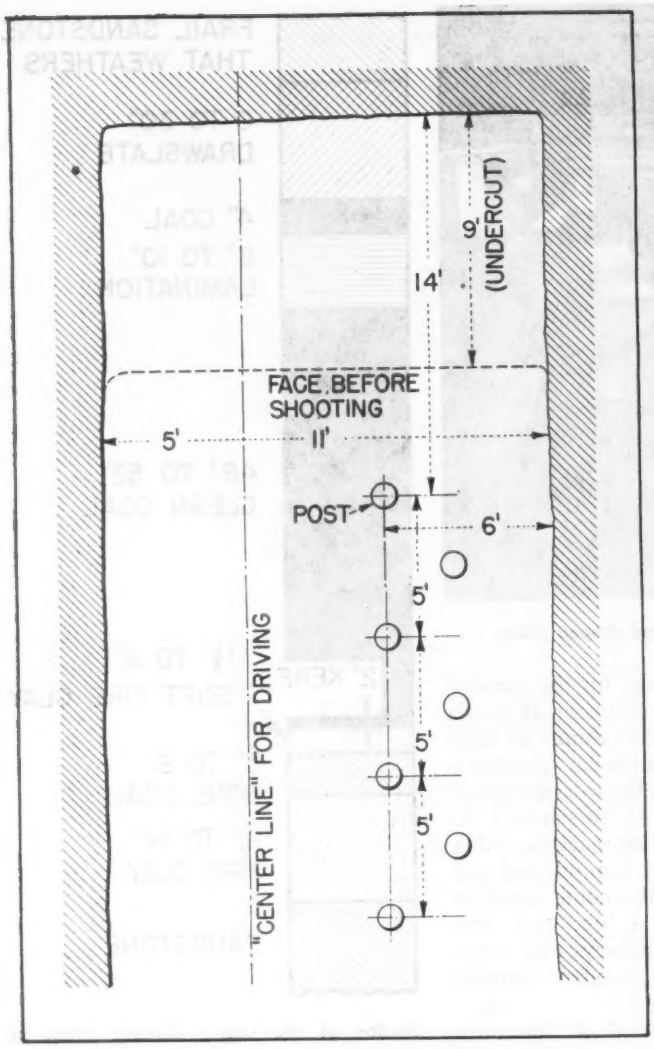
In the four sections of the mine there usually are five to ten spots 50 to 100 ft. in length over which wooden runways must be laid for the shuttle cars. Planks 3x10 in. x 14 ft. long are



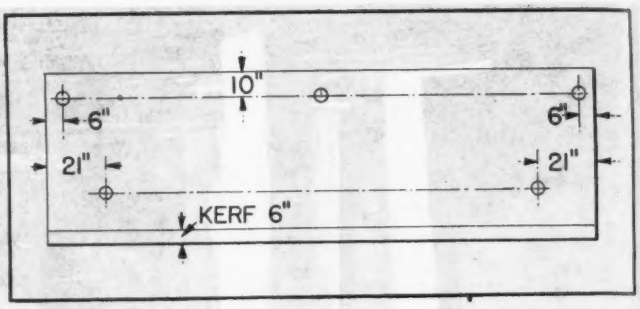
Looking outby from the face of a working place. The shortwall has finished cutting and is being loaded onto the crawler-mounted truck. Here, 8 in. of drawslate has come down.



Ready for the loading machine—heading 16 ft. wide shot down, drawslate gobbed between posts, a prop set 14 ft. from the back of the cut and the fall of coal rock-dusted.



Standard timbering at the face when driving a heading, breakthrough or room.



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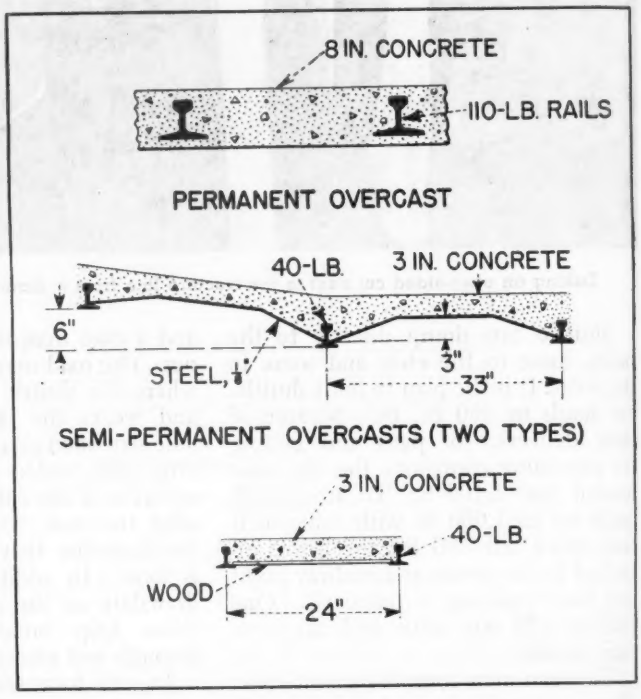
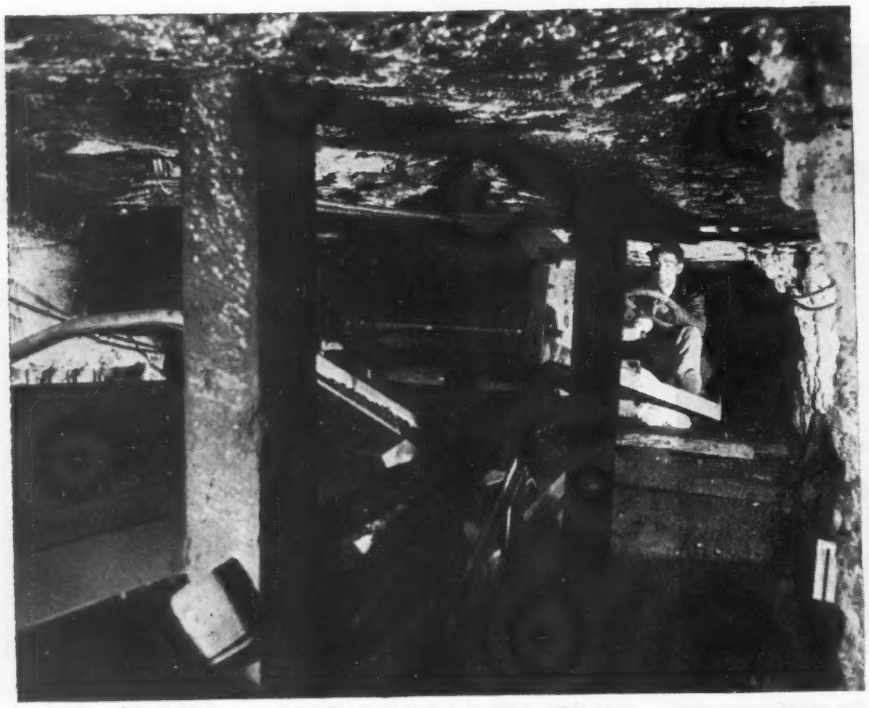
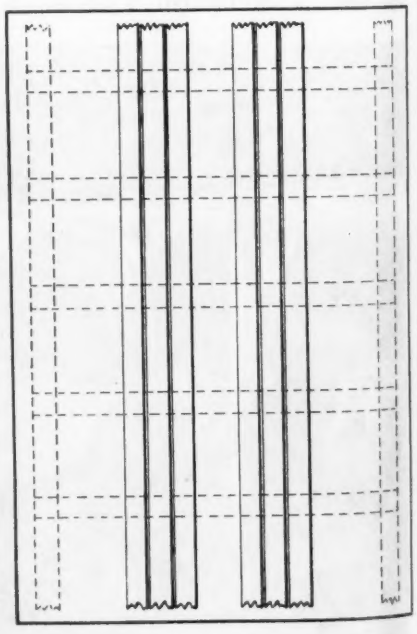


Three types of overcasts are employed. Views show certain construction details.



Cable-reel shuttle car dumping to the end of a 30-in. belt conveyor.



Solid lines indicate 3x10-in. x 14-ft.-long planks laid for shuttle cars in soft places. Planks of the same size are added per dotted lines in the worst places.

used. If the hole is not particularly bad three planks side by side constitute the track for each wheel. In the worst places these tread planks are laid on others used as crossties. The ties are held in place by planks spiked along the ends.

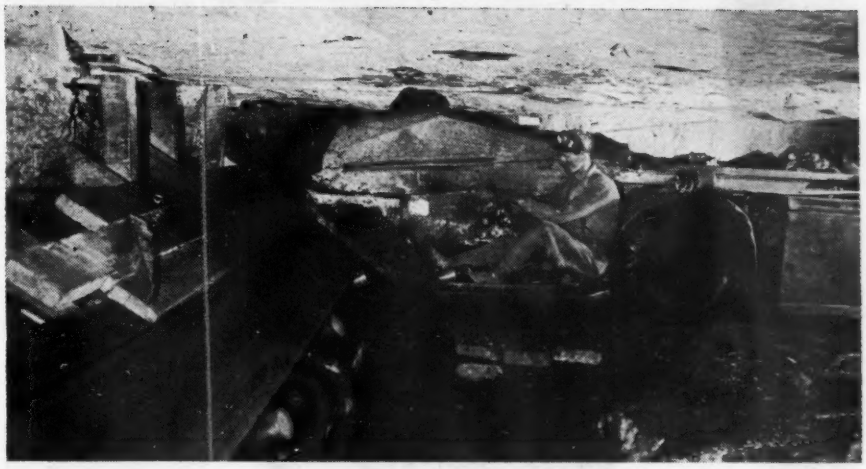
Coal is shot with permissible explosive. Each of the five holes, three top and two bottom, are loaded with three 1¼x8-in. sticks. This throws practically all of the coal down, so the loading machines need do no digging.

Standard timbering in a 16-ft. working place consists of one row of posts 5 ft. apart on a line 6 ft. from the right-hand rib. When the loader enters there is a post 14 ft. from the back of the cut that has been shot down. In relation to the projection "center lines," places are driven with the left-hand rib 5 ft. from that line.

The four loaders regularly load two shifts. Portal-to-portal hours are 7 a.m. to 4 p.m. for the first shift and 3:15 p.m. to midnight for the second. On the third shift one skeleton crew of mine men works one loading machine part of the time. These men spend at least 50 percent of their time at construction work such as bridges and overcasts.

Of the six headings constituting an entry, the center pair are intakes and the other four returns. The 71,000 c.f.m. of air at 0.45-in. water gage now circulated by a 5-ft. modern fan courses through eight splits. The fan is driven by a 20-hp. 2,300-volt slip-ring induction motor, resistance speed control.

All doors are in pairs forming air locks. Overcasts, built at the mouths of branch entries, are of two general types, permanent and semi-permanent. The former have 8-in. slabs of concrete reinforced with 110-lb. rails on 24-in. centers and have walls 8 in. thick of twin brick. Two different designs have been used for the semi-permanent ones. The first consists of 40-lb. rails on 24-in. centers with wooden spacers between and 3 in. of concrete over the wood. In the other type the rails are the same weight but on 33-in. centers and between them are sheets of ⅛-in. steel in pieces 34x40 in. and curved or bent to an arch. These also have 3 in. of concrete over the top. The latest of this type built over supply tracks have the "low-bridge" approach corners made less sudden by having the outside span rails elevated 6 in. higher than the others.



Battery-type shuttle car ready to dump to the side of the belt.

Bridges 12 ft. wide by which supply tracks cross over belts are built as follows: 12-ft. span supported by 110-lb. rails on 18-in. centers with these rails bolted on top of 12-in. I-beams that in turn rest on three concrete piers; spaces between rails filled by blocks sawed to short lengths from 3x10-in. planks; 5x10-in. x 12-ft. crossties laid skin to skin and the track rails spiked to them. Clearance under the bridge is 4 ft. to the floor of the belt heading.

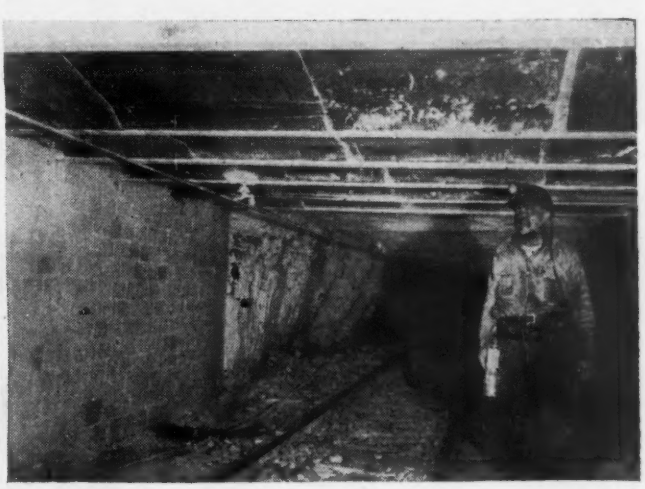
Supply tracks are 40-lb. rails on creosoted ties (60 lb. pressure-treated). Both rails are bonded with cross bonds every 200 ft. A 500,000-cir.mil negative return wire lies on the mine floor along the track and is connected thereto at 300-ft. intervals. The trolley wire is 350,000-cir.mil No. 9 section and is in parallel with a 1,000,000-cir.mil feeder. At intervals not exceeding 1,000 ft. 600-volt quick-break knife switches are installed in both trolley and feeder.

Supply cars have a strong 3-ton all-steel solid body and are equipped with anti-friction bearings. Wheel hoods are flat on top. The hood on each side consists of a continuous flat piece over the two wheels, forming a seat for men riding in the cars. At present about 25 of these cars are in use.

D.c. power is supplied by a 300-kw. rotary converter with manual start and automatic feeder control. It is driven by purchased power and is installed in an outside substation.

Storage of daily supplies of powder

Operators stationed at points where cross-entry belts discharge to the main belt start and stop the cross-entry belts in accordance with whether they are carrying coal or rock. Rock is not loaded until there is an empty space on the main belt.



John Coyer, general mine foreman, walks the tracks under a semi-permanent overcast. It has steel sheets on the under side and the first support rail is elevated 6 in. to make a less abrupt approach. Another type also employed uses a slightly different construction.

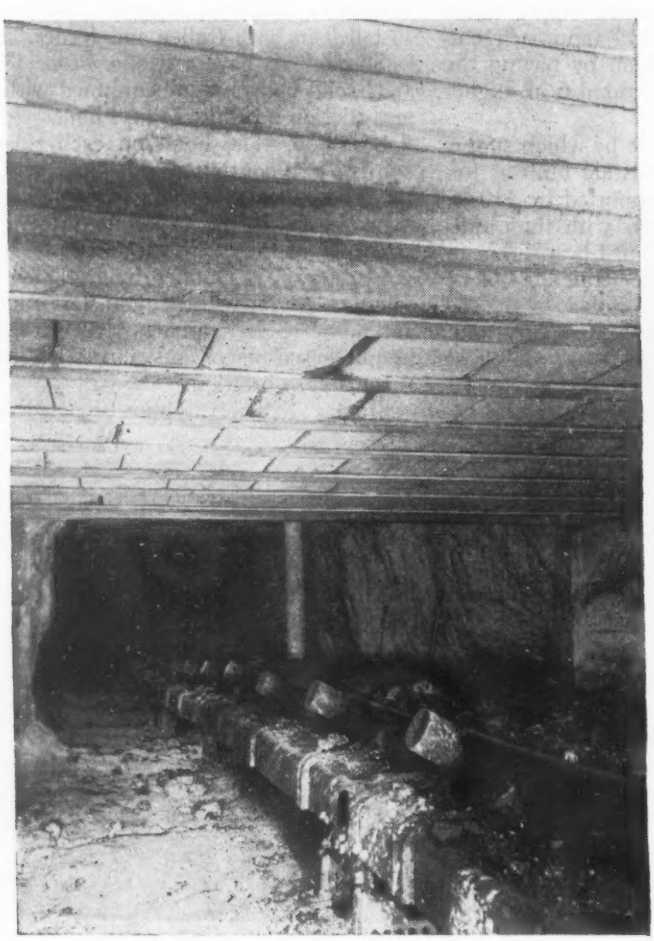
Supply-track bridge over the main belt. Rails of 110-lb. size form a 12-ft. span. They are supported on I-beams resting on concrete piers.

and caps underground in the mining sections is in boxes built of brick, rubber and steel and mounted on wooden sleds. These are described in the Operating Ideas section (p. 126).

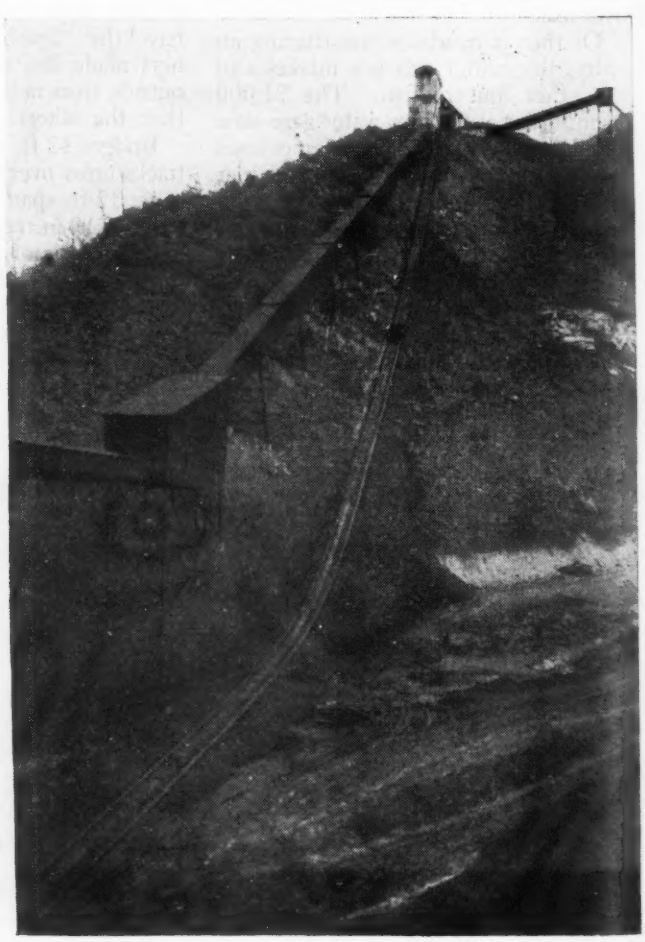
With the dual-truck rock-duster listed with the underground equipment, the whole mine is kept heavily rock-dusted. Working places are rock-dusted by hand after each shot prior to entrance of the loading machine. This includes a coat on top of the coal that has been shot down.

The hoist for handling men and materials up and down the incline from the service building to the mine level is classed as outside equipment but actually is installed underground. It is 200 ft. in from the portal of a heading that lines with the knuckle at the top of the incline. By this simple arrangement little grading was required for the track on which hoisted cars are switched back into the mine yard. The hoist is driven by a 125-hp. 2,300-volt motor.

The incline has two tracks, one intended for man hoisting and the other for hoisting materials. The latter is curved at the bottom of the incline and is carried past the service building and

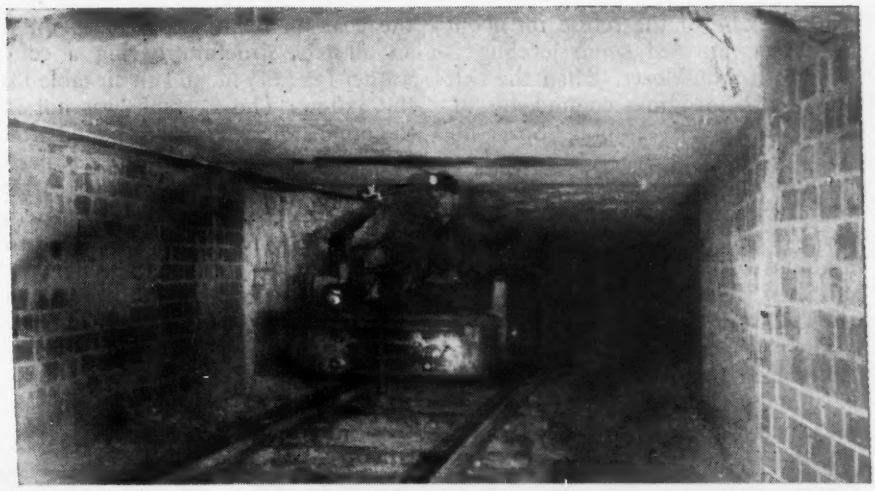


The 110-lb. rails forming the span of a supply-track bridge over the belt are spaced on 18-in. centers and filled with blocks cut from 3x10-in. planks.



A car of washer refuse is on its way up the incline. At the headhouse it dumps into a bin that also receives mine rock and table pickings.

Eight-ton supply locomotive under a permanent overcast. The 8-in. slab is reinforced with 110-lb. rails on 24-in. centers.



A modern 5-ft. fan supplies air. At the right, a supply car has been stopped just short of the mine portal after being hoisted up the incline and is about to be switched into the mine yard. The hoist is 200 ft. inside the portal with the incline directly in front.

into the timber yard. Under this track an underground pass was built for men walking from the service building to the man hoisting station.

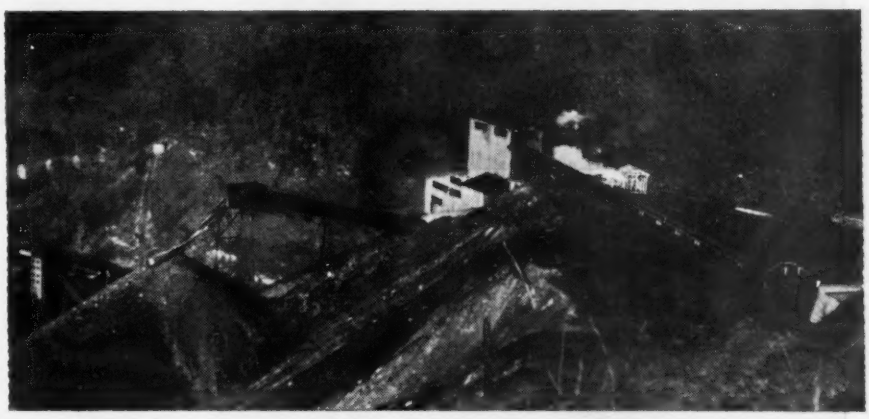
The man track was not in use at the time of this writing, pending delivery of a special man car seating twelve men. In addition to the hoist rope there will be attached to this car another rope which is to be threaded over a head-sheave arrangement and connected to a balancing car on the materials track. In case of overspeed a brake on the head sheave will set automatically.

A shop building 40x133½ ft. near the belt portal is built of brick. It houses a blacksmith shop, machine shop, tool and supply room, furnace room and oil house. The machine shop has the following equipment: 36-in. radial drill, 20-in. industrial shaper, 22-in. lathe with 10-ft. bed, power hack saw, 3-hp. double-wheel grinder accommodating 2½x14-in. wheels and a vulcanizer for trailing cables. The shop has two items of used equipment: a 150-ton wheel press and a 300-amp. portable welder with d.c. drive.

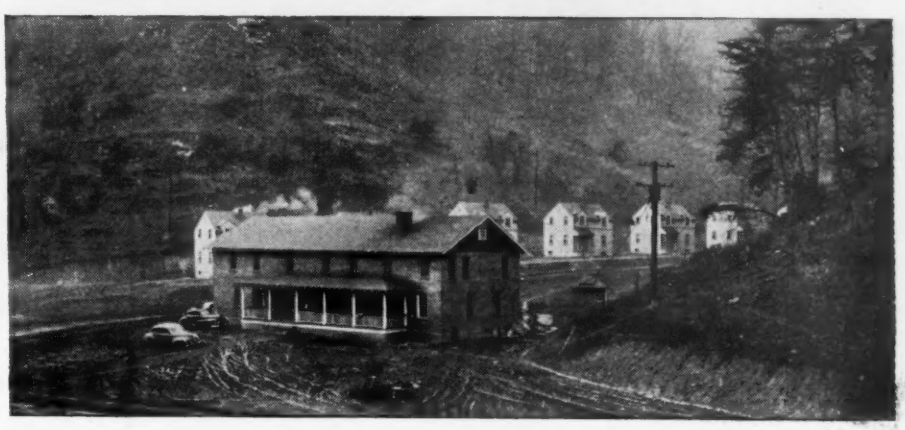
Rated capacity of the preparation plant is 250 tons per hour of coal previously hand-picked in the headhouse. In the latter an operator stationed at the end of the mine belt throws a fly gate to divert the belt discharge to a 100-ton coal bin or to a refuse bin, depending on whether coal or slate is coming out on the belt. From the bin the coal passes over a 4-in. scalping screen. The undersize is bypassed to the rope-and button retarding conveyor while the plus 4-in. goes over an apron-type picking table and then through a crusher (24x36-in. single roll) to the rope-and-button conveyor.

Pickings from the headhouse table are conveyed back to the slate bin that receives mine rock. To that bin also goes reject from the cleaning plant at the bottom of the hill. It is hoisted up an incline in a 5-ton bottom-dumping car by a single-drum hoist powered by a 100-hp. 440-volt motor.

From this refuse bin at the headhouse the material is conveyed on a 36-in. belt (7½-hp. motor) to an elevated discharge point nearby. From there the refuse is chuted directly to the dumping ground. The arrangement



General view—preparation plant, refuse belt and dump, headhouse and belt from mine.



Some of the houses for Republic miners show in the rear of the superintendent's office and clubhouse.

will take care of the refuse for about five years provided some leveling is done with a bulldozer. Then the belt can be extended to accommodate another five years of dumping. Space for many years is available.

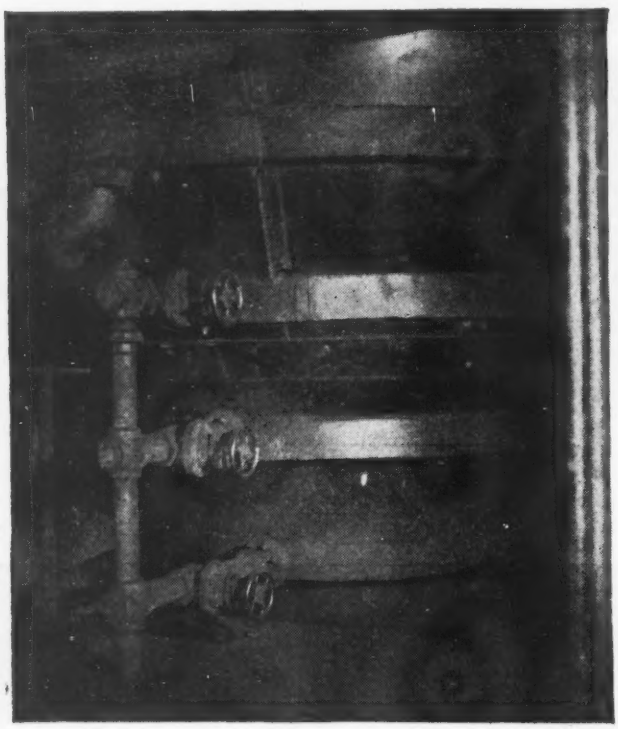
Motors of 40 hp. each are used on the crusher and rope-and-button conveyor. Total horsepower of the mine headhouse motors, including the slate hoist, is 252½ and all these motors are operated on 440 volts.

The rope-and-button conveyor is 680 ft. long (c.c.) and the angle from horizontal is 23½ deg. From its foot a 30-in. belt 300 ft. long (c.c.) delivers the coal to the tipple. This plant is an all-steel structure having a cone washer for ¼x4½-in. and an air table for the ¼x0-in. The air table was not in the original design but was added after operating experience indicated need for dry treatment of the fines. After being cleaned the two sizes are mixed, and then loaded by chutes to two tracks.

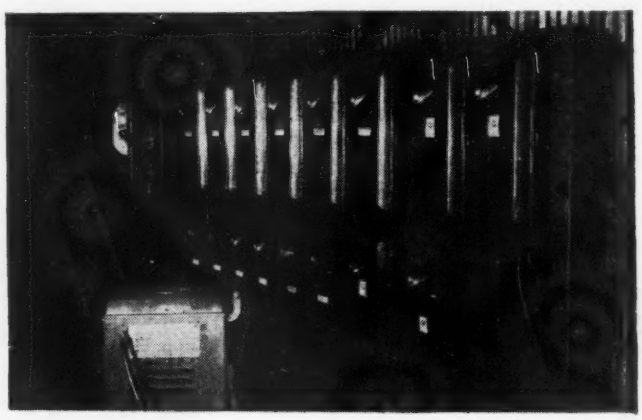
Preliminary separation into two sizes for cleaning is done on a 6x14-ft. double-deck vibrating screen which receives the coal direct from the 300-ft. belt conveyor. Dewatering is done on Parrish-type shakers with wedge-wire decks and the refuse is desanded on a 4½x8-ft. double-deck vibrating screen.

Sludge is pumped up a slight grade to a side hollow and into a settling pond 600 ft. from the tipple. The overflow drains back to a clear water pond and then returns to the plant by gravity. Make-up water comes from two deep wells. A 100-c.f.m. compressor furnishes air for operating the refuse gates.

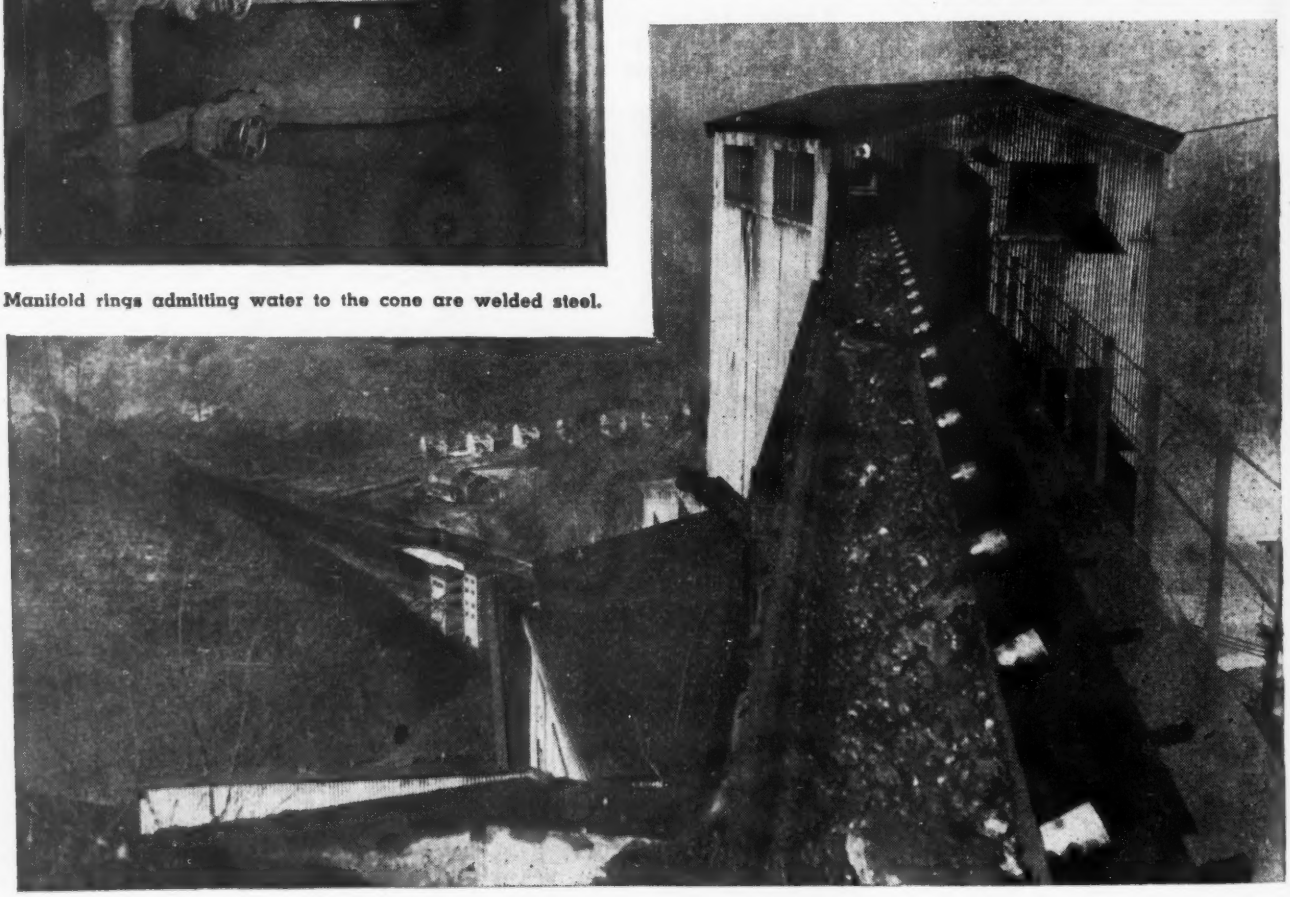
Plant drives comprise 37 400-volt motors, totaling 318.5 hp. Those of the original installation are as follows: raw coal belt, 10 hp.; raw coal vibrator, 10 hp.; cone agitator, 7½; dewatering



Manifold rings admitting water to the cone are welded steel.



A.c. welder and combination starters in the preparation plant.



Mine belt discharging to 100-ton bin in the headhouse. In the valley are the preparation plant, office and some of the houses. An operator stationed in the top of the headhouse at the end of the belt operates a fly gate to direct coal and rock to their respective bins.

screen, 15; compressor, 25; refuse elevator, 7½; refuse desanding vibrator, 3; gate for loading refuse into incline cars, 3; sand pump, 30; water-circulating pump, 75; clarified-water pump, 7½; sludge pumps, two, 10-hp., and a sand elevator, 3 hp. Controls are "De-ion combination" starters. For maintenance of the preparation equipment the plant is equipped with a portable 200-amp. a.c. welder.

Installation of an air cleaning plant added the following motors: slack elevator, 10 hp.; slack conveyor, 10; pressure fan, 30; exhaust fan, 40; recirculating fan, 7½; flutter valve drive (gearmotor), 2; deduster, 2; and air table, two ½-hp. motors.

Sound-absorbing telephone booths are installed in both the headhouse and cleaning plant, one in each. These are a doorless-type booth yet are entirely effective in allowing free conversation over phones in very noisy places. Two booths of the same type have been installed inside of the mine (see Operating Ideas section of this issue, p. 126).

Service Building Is Brick

The service building, a 40x80-ft. two-story structure built of Speed-brick and including a basement, lives up to its name. The basement houses heavy supplies, the first floor the small supplies, storekeeper's office, general mine foreman's office, mine-rescue and first-aid room, lamphouse and miner's bathhouse having both lockers and baskets. The mining engineer has his office and workroom on the second floor. Caplamp equipment for the mine consists of 225 lamps.

J. L. Hamilton, Uniontown, Pa., is manager of Northern Coal Mines for the Republic Steel Corp. and these northern mines include this new Republic mine in Kentucky. E. B. Winning, Cleveland, Ohio, now assistant to the vice president in charge of operations, looks after all mining for the corporation. He was manager of Northern Coal Mines during the planning and installation of Republic. At the Uniontown headquarters for Northern Coal Mines M. O. Evans is chief engineer; Clyde R. Weihe, mechanical engineer; and Leslie Bolender, electrical engineer.

F. L. Sanders is superintendent of Republic mine. John Coyer is mine foreman; W. D. Donaldson, assistant to Mr. Coyer; W. A. Eades, night foreman; Byron Coleman, master mechanic; George Eagle, cleaning-plant supervisor and outside electrician; B. A. Dickerson, storekeeper (mine supplies); and Edgar Elswick, mining engineer.

Holding down the chair is F. L. Sanders, Republic mine superintendent. Standing, left to right, are Ersel Ratliff, William A. Eades, H. C. Hatfield, Archie Simkins, A. C. Rudd and B. A. Dickerson. Mr. Dickerson is storekeeper and Mr. Eades is night foreman. The others are mine foremen—mechanical and are ready to go in on the second shift.

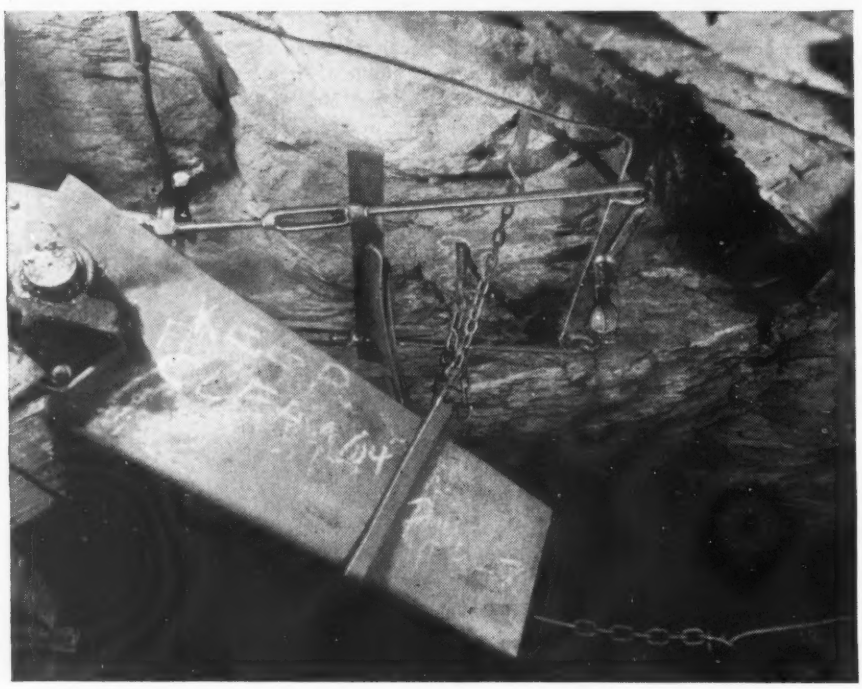
General Mine Foreman John Coyer is seated at the desk. Standing, left to right, are H. M. Whitaker, W. K. Donaldson, Ted Simpkins, John W. Clevinger, W. A. Waters and Edgar Elswick. Mr. Donaldson is assistant general mine foreman and Mr. Elswick is mining engineer. The others are mine foremen—mechanical who have just completed the first shift.

Day-shift maintenance crew: Shirley Smith (left), Otis Elswick, Ed Belcher, Byron Coleman and Stonewall Osborn. Mr. Coleman is chief electrician.

SHAKERS AND BELTS

Permit Ross-Vein Mining at Westmoreland

Top Ross, 24 to 40 In. Thick, Worked by Belts Through Rock Holes From Bottom Ross—Shaker Conveyors Bring Coal Out of Chambers to Belts—Savings Include Sharp Reduction in Lifting of Bottom



How the belt line is anchored in the rock above the loading station.

By RALPH R. RICHART
Assistant Editor, *Coal Age*

SHAKERS and belt conveyors are making it possible to mine the thin Ross veins profitably at The Lehigh Valley Coal Co.'s Westmoreland colliery near West Wyoming, Luzerne County, Pa. Using shakers in the chambers and belts to carry the coal to the car-loading stations eliminates the need for blowing rock except on the motor roads. At present, 45 percent of the colliery's output comes from the thinnest veins.

Although mining operations at this property date back to 1890 the installation of shakers and belts to supplement conventional haulage equipment has given the colliery new life. Prior to trial of this scheme no work in the Top or Bottom Ross had been especially successful and these veins had always been bypassed for thicker ones. Experimental work paving the way for the introduction and extension

Belt drive placed on cribbing to get necessary height at Bottom Ross loading station.

Section of belt conveyor on 15-deg. pitch between the Top and Bottom Ross.

of mechanical mining began after the colliery closed in 1931. The first work involved the use of scrapers and undercutters. Later, shakers were tried as a supplement to the transportation system. When the colliery was reopened in 1934, shaking conveyors, as standard equipment, became a part of the mining operation in the Marcy vein. Thus the need for rail haulage in chambers began to be reduced.

First Belt in 1939

At present, second mining is in progress in the Pittston or Six Foot vein and in the Marcy or Skidmore (3½ to 4 ft.). In both, shakers are used in the chambers as a supplement to the haulage system. First mining is being done in the Top Ross (24 to 40 in.) and in the Bottom Ross (24 to 30 in.), where both shakers and belts are used to decrease the need for rail haulage even more.

The first belt conveyor was installed in the summer of 1939 to gather from shakers already operating in the chambers. This belt, an 18-in.-wide unit 600 ft. long, was brought from the Exeter mine and installed with a 10-hp.. drive. The success of this original belt conveyor led to the purchase of more and the colliery has standardized on Goodman 20-in. units powered with 15-hp. drives. These belts are extended in 300-ft. sections (600 ft. of belt) using 21-in. 6-ply 38-oz. Hewitt belts joined with Flexco No. 1½ splices. Some of the units, operating with as many as five sections of belting, measure 1,500 ft. from head pulley to tail pulley.

The mining plan for the Top and Bottom Ross (Fig. 1) includes driving motor roads 12 ft. wide, taking coal and blowing enough rock to provide 6 ft. of clearance between the rail and any timbering overhead. This often means taking up as much as 3½ ft. of rock, always an expensive operation. At right angles to the motor road, and almost opposite one another, belt roads 16 to 18 ft. wide are driven on 300-ft. centers to a depth of 1,000 ft. Chambers 24 to 28 ft. wide are driven on 50-ft. centers between the belt roads. A reserve pillar of 60 to 100 ft. is left on either side of the motor road.

Shakers and Belts Cheaper

Credit for lowering the mining costs in this thin-vein work is due to the use of shakers in the chambers and the installation of belts operating in belt roads. Prior to the adoption of belts for haulage, it was necessary, to maintain output, to keep 12 to 13 gangways driving at all times, in all of which bottom rock had to be blown for motor haulage. Installation of belts reduced the number of haulage roads for development to three to four at any one time. Eliminating the extra rock work, with the exception of the comparatively small amount on the motor roads, spelled the difference between being able to mine the thin veins profitably or bypassing them year after year. Fig. 1 shows that with the conveyor system it is necessary to plan for a motor road only every 2,000 ft.

The interval between the Top and Bottom Ross is 15 to 20 ft. and consequently it was decided to mine the Top Ross with conveyors and load the coal into cars in the Bottom Ross as shown in Figs. 2 and 3. After a territory in the Bottom Ross is worked out a rock hole is driven from the Bottom

Cars are topped before leaving the loading station.

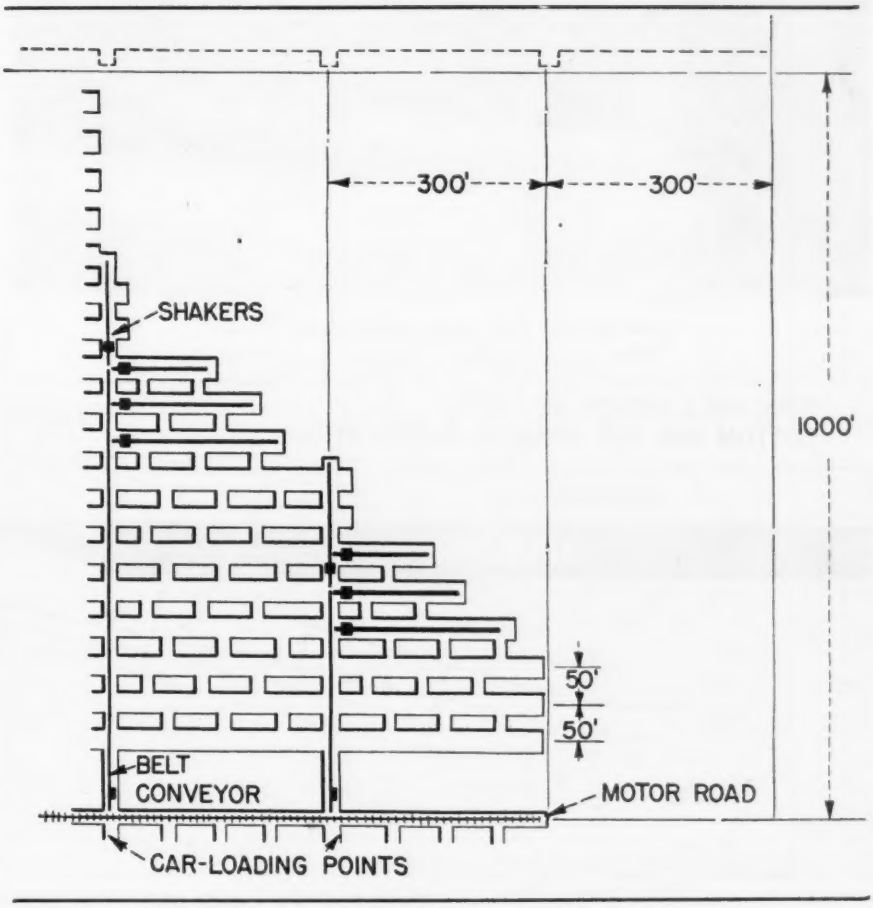
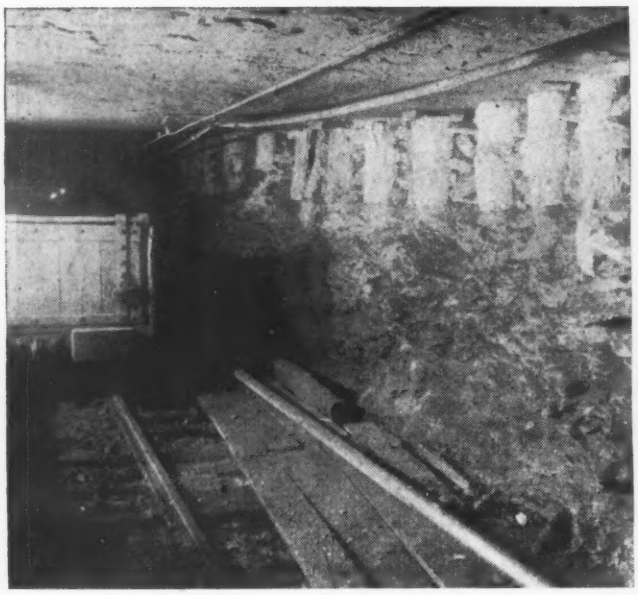


Fig. 1—Mining plan for the thin Ross veins makes use of shakers, belts and rail transportation.



As much as 3½ ft. of rock is removed to get clearance on the motor roads.

John Gamble, section foreman, has been with the company 25 years.

J. H. Haertter (left), superintendent, and Jacob Miller, inside foreman, discuss a problem.

Ross loading station up into the Top Ross on a pitch of 15 deg. Once in the Top Ross the belt road is advanced in the coal according to the usual plan. This makes it possible to work the Top Ross without the costly development of motor roads and doubles the life of each loading station in the lower vein.

Work Both Ways

This scheme lends itself to working the coal in both directions in the Top Ross. When the belt is transferred to the opposite side, the coal is discharged down through a vertical rock hole into the car below, as shown diagrammatically in Fig. 3.

Very little trouble is encountered

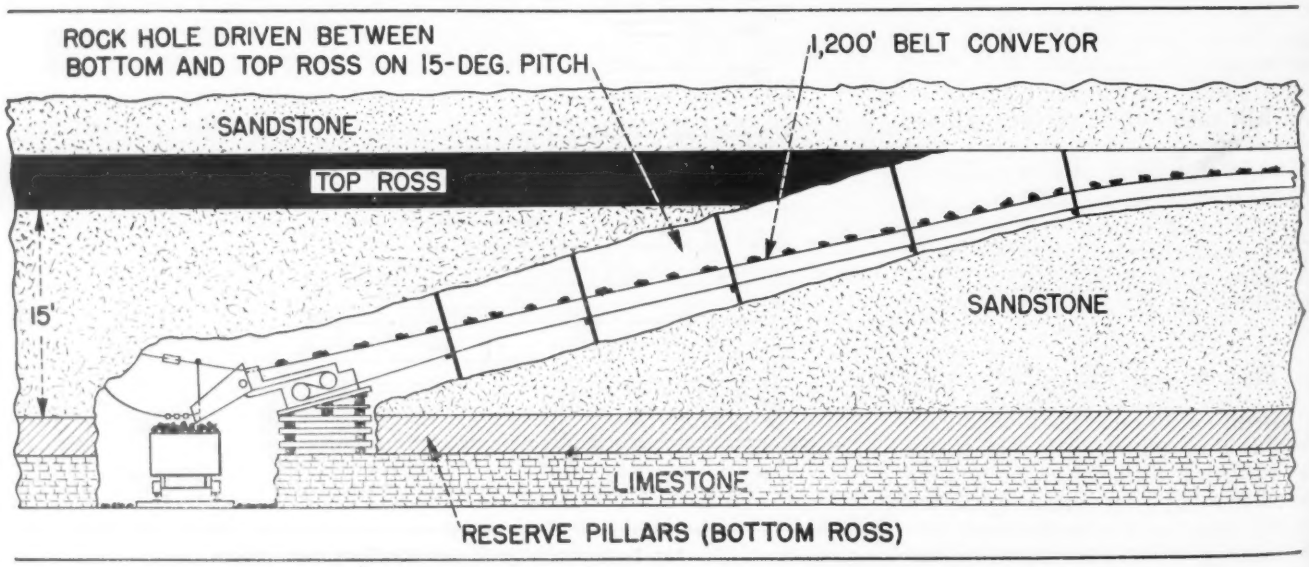
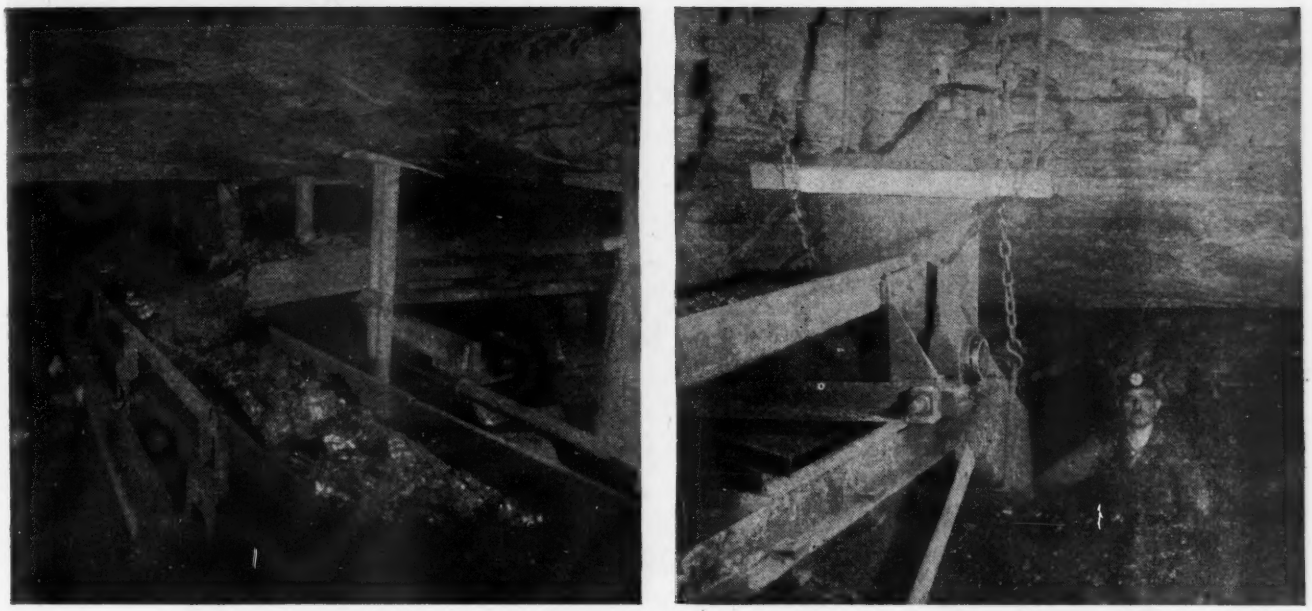


Fig. 3—After the Bottom Ross is worked the same loading station serves for mining the Top Ross.



Left: As many as four shakers discharge to one belt. Right: Considerable rock must be taken down to provide height at the Bottom Ross loading station.

in the operation of these conveyors as a result of the care with which each unit is installed. A special four-man crew takes care of setting all shaker and belt drives, extending all belts, rechecking the alignment and blocking of shakers and moving of all units from worked-out areas. In setting up, everything must line with the surveyors' spads, after which it is a question of good blocking. All units are either blocked level or blocked to an even grade, and all irregular sags and dips are avoided. Regardless of vein thickness the minimum height for conveyor erection and operation has been set at 30 in. One man is responsible for lubricating all conveyors and their drives.

In dismantling the shakers when a chamber is finished the pans are moved back on the shaker and then are transported on the belt to the site of a new chamber or to the motor road and out of the territory.

Reverse Protection

All belts can be reversed to carry supplies into the mouths of the various chambers. To make the shakers inoperative while a belt is reversed a special transposition is made in the electrical control circuit of the shakers. As long as coal is being conveyed the positive lead of the control circuit for the shakers is attached to the positive brushholder of the motor driving the belt. To reverse the belt motor the polarity of the brushholders and armature circuit is reversed. This means that the polarity of the original positive brushholder now becomes negative and in turn the control circuit to the shakers is affected. This makes both sides of the control circuit negative for the shakers and therefore, with no difference of potential, the control circuit is inoperative until the belt motor is switched again for forward travel.

Some 60 shakers are in service in various veins at the colliery and include Vulcan Types ETO (7½ hp.) and ET1 (10 hp.) and Goodman Type E-11 (10 hp.) units. The special four-man crew sets each shaker drive and arranges the discharge end for dumping onto the belt conveyor. From there on the crew working the chamber adds the 10-ft. pan sections. The inby end

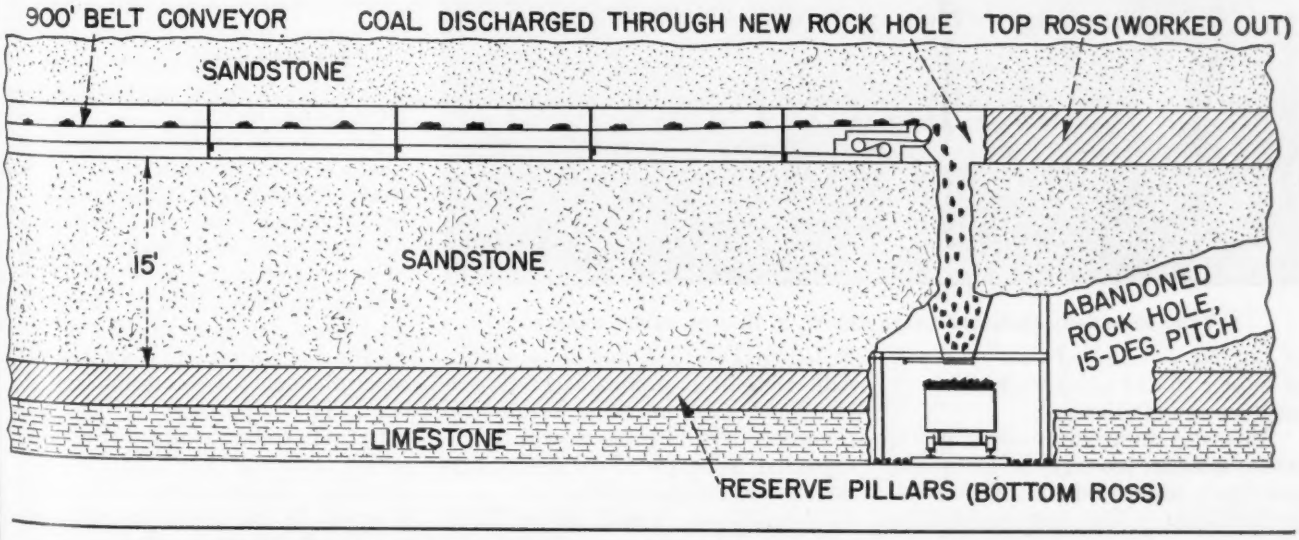


Fig. 3—The Top Ross is mined in both directions and loaded at the same point on the Bottom Ross level.

Coal is hand loaded onto the shaking conveyors.

Ralph Frost (left), electrician, poses with W. R. Thomas, outside foreman.

of the last pan section rides on a pile of loose coal and slides back and forth without any interference.

All coal is undercut except in places where there are too many sulphur balls, too much water and too much pitch to the seam. The shortwall cutting machines are Goodman Type 412 CA or Jeffrey Type 35L and are equipped with 50-hp. d.c. motors and 6-ft. cutter bars. One machine serves two chambers. Drilling is done with Ingersoll-Rand Type JA 45 air drills using hollow-steel one-piece bits.

Chambers are mined 24 to 28 ft. wide by a four-man crew consisting of a miner, two laborers and undercutter operator. A chamber in the Top Ross mined to a depth of 300 ft. lasts 20 to 24 working days on two-shift operation. When the face is undercut, only four holes are necessary: two top and two bottom. When the chambers are mined on the solid as many as 14 holes are required to blast down the coal. Three to four sticks of Hercules 4F permissible are used to each hole. On-shift shooting is permitted but no more than one to five delays are used in one series of blasting caps.

Accidents from falls at the face are very infrequent because of the rigid observance of rules for timbering. As the face is undercut, props are set behind the cutting machine as close as a foot to the face and are never spaced more than 6 ft. apart.

The officials of The Lehigh Valley Coal Co. with headquarters in Wilkes-Barre, Pa., are: L. R. Close, president; B. Henderson, vice president; K. F. Arbogast, general manager; Osborne Morgan, safety manager; H. W. Montz, mining engineer; Edgar Schweitzer, mechanical engineer; E. B. Wagner, electrical engineer, and J. H. Haertter, superintendent of Westmoreland colliery. The supervisors at the Westmoreland colliery, near West Wyoming, Pa., are: Jacob Miller, inside foreman; Ralph Frost, electrician; Howard Gromel, master mechanic; and W. R. Thomas, outside foreman.

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COAL AGE ANNOUNCES

1945

Coal-for-Victory

AWARDS

★ ★ ★ ★ ★ ★ ★ ★ ★

VICTORY IN EUROPE was a victory for mining, manufacturing and transportation in the United States. But a job as big or bigger lies ahead—Victory in Japan. Material requirements are little, if any, less. Coal requirements, for instance, are estimated at 605,000,000 tons of bituminous and 67,000,000 tons of anthracite in 1945, only 2½ percent under the 1944 goal of 691,000,000 tons.

Production of every possible pound of coal consequently remains the No. 1 job for the industry. For its devotion to that goal and for carrying on in the spirit that set new tonnage records in 1944 and brought "Coal-for-Victory" awards to 116 mines and collieries, coal again will prove its right to richly deserved recognition for a job well done.

The 1944 "Coal-for-Victory" awards are credited by both operators and the Solid Fuels Administration for War with having been a real spur to production and efficiency. Many operators have requested that they be repeated in 1945 and SFAW indorses this request. Therefore, *Coal Age*, with the support and cooperation of the Solid Fuels Administration for War, announces its

"1945 Coal-for-Victory Awards"

Every serialized mine in the United States that was open for production throughout 1944 and 1945 is eligible to qualify for these awards. To recognize meritorious achieve-

Victory Still Coal's Big Job

Underwood & Underwood

Victory in Europe should not blind us to the fact that we still have a full-scale war to win in the Pacific. To back up that war effort to the utmost, coal in quantities scarcely less than the record-breaking tonnages of 1944 still is vital.

The task for 1945 is no little one and is complicated by continuing loss of manpower and other difficulties inherent in the fourth year of an unprecedented war job. But I am sure that the coal industry will again discharge its responsibility with the courage and patriotism it has shown in meeting all other tests since the war started.

Anything that will help stimulate production in this critical period in our military effort will help to bring victory that much quicker. Coal is vital and the Solid Fuels Administration for War still believes that any plan that will help to get out the tonnage is worth supporting. The 1944 "Coal-for-Victory" awards, bringing well merited recognition to those mines contributing most to the war effort, were a real incentive to production. The 1945 awards should serve an equally valuable purpose.

C. J. POTTER
Deputy Solid Fuels Administrator for War

1945 War Production EFFICIENCY AWARD

COAL AGE Presents to the Officials and Employees of:

This certificate in honor of their outstanding contribution to the national war effort in the form of increased productive efficiency in 1945 above and beyond the average for the industry, thereby materially advancing the cause of victory for the United States and its Allies.

DATED_____

PUBLISHER, COAL AGE

EDITOR, COAL AGE

Reproduced here is a facsimile of the "1945 War - Production - Efficiency" award to be presented to mines or collieries increasing their output per manshift by 5 percent or more. The certificates are the same size as last year, 11x14, although the design has been slightly altered. Both this certificate and the "Victory-Production" award on the opposite page will be in three colors.

ment in the vital field of more efficient production as well as tonnage, any serialized mine otherwise qualifying under the rules is eligible for one or both of the following:

1. The "1945 War Production Efficiency Award" honoring significant increases in individual productivity with consequent improvement in ability to utilize available manpower better. This award is to be presented to mines or collieries increasing output per manshift 5 percent or more in the calendar year 1945 as compared with the calendar year 1944.

2. The "1945 Victory Production Award," to be presented to mines or collieries producing in 1945 a tonnage equal to or greater than in 1944.

The certificates to be awarded qualifying mines or collieries are reproduced elsewhere in this announcement. In addition, individual certificates attesting their part in reaching or exceeding the required efficiency and production goals will be awarded, upon request, to all members of the supervisory staff of each mine or colliery winning an award or awards. If the company operating a winning mine or colliery so desires, emblems for presentation to employees will be made available by *Coal Age*.

Coal Age again offers these "Coal-for-Victory" awards with two thoughts in mind:

1. Stimulation of vital coal production in this critical fourth year of the war.

2. Fitting recognition of exceptional contribution to the war effort by coal mines and collieries, their officials and their employees.

While the awards again are offered as a contribution toward winning the war, production and efficiency increases qualifying a mine or colliery for an award or awards will represent another solid investment for the peacetime future. More efficient production

The "1945 Victory Production" award shown here will be presented to qualifying mines or collieries which either reach or exceed last year's tonnage. In addition to the company awards, similar but smaller certificates will be awarded, on request, to the supervisory staffs of winning mines or collieries. Emblems for presentation to employees of award winners also will be made available.

1945

Victory Production AWARD

COAL AGE Presents to the Officials and Employees of:

_____

This certificate in honor of their outstanding contribution to the national war effort in the form of coal production in 1945 equal to or beyond the national goal, thereby materially advancing the cause of victory for the United States and its Allies.

DATED:_____

PUBLISHER, COAL AGE

EDITOR, COAL AGE

methods, greater use of machinery and better utilization of manpower build tonnage for victory and a more favorable competitive position in the years ahead. Output to meet every war and essential need remains the best means of insuring good will for coal and a higher standing with the public growing out of a job well done.

The men who operate the nation's mines and collieries are showing their determination to discharge to the fullest their war obligations. A little extra effort to raise productivity and tonnage will bring a "1945 Coal-for-Victory" award—and lick Japan that much sooner.

Additional copies of this award announcement will be supplied coal-company and mine officials upon request to Coal Age, 330 West 42d St., New York 18, N. Y.

HOW YOUR OPERATION CAN WIN "1945 COAL-FOR-VICTORY AWARDS"

1. Any mine or colliery in the United States that has a War Production Board serial number and was open for production throughout the calendar years 1944 and 1945 is eligible to compete for the "1945 War-Production-Efficiency Award" or the "1945 Victory-Production Award" or both.

2. The "1945 War - Production - Efficiency Award" will be presented to any serialized mine or colliery otherwise qualifying that increases its output per manshift 5 percent or more in the calendar year 1945 as compared with the calendar year 1944. This award is intended to recognize outstanding achievement in increasing efficiency by the methods normally employed and judging shall not be alone on the results but also on how they were achieved. Mines filing for the "1945 War-Production-Efficiency Award," therefore, shall supply a statement outlining how the increase in output per manshift was attained and shall agree to supply, upon request, such additional information as may be required to permit a decision to be reached.

3. The "1945 Victory-Production Award" will be presented to any serialized mine or colliery otherwise qualifying if its coal production in the calendar year 1945 was equal to or more than its production in the calendar year 1944.

4. More than one mine or colliery operated by any one company is eligible for and may receive either or both awards if they otherwise qualify. The winning of an award, or awards, by one mine or colliery operated by a specific company shall not prevent another mine or colliery operated by the same company from also winning one or both awards if it otherwise qualifies.

5. The awards to mines or collieries will consist of certificates attesting their contribution to the 1945 war effort by meeting or bettering the goals established. Individual certificates also will be awarded, upon request, to each member of the winning mine or colliery's supervisory staff attesting their contribution to the war effort as evidenced by an award to the mine or colliery. Should the operating company so decide, emblems for presentation to employees at winning mines or collieries will be made available by Coal Age.

6. Qualifications for the awards shall be judged on the basis of statements submitted by authorized officials of the companies operating the mines or collieries in question on official forms to be supplied by Coal Age. Statements must be completely filled out and must be filed on or before Feb. 10, 1946. Postmarks shall be the guide in judging acceptability under this restriction.

7. Coal Age reserves the right to request from appropriate government or other statistical agencies certification of production and other figures submitted by coal companies filing for an award or awards, and such companies shall agree that statements are submitted subject to such certification.

8. A board of judges nominated by Coal Age shall be the sole judges of the qualifications for awards and coal companies filing for the awards shall agree that their decision shall be final.

9. Realizing that changes arising out of the course of the war might materially alter conditions, Coal Age reserves the right, if in its judgment it should appear to be necessary, to modify the terms and conditions of the awards, adopt new terms and conditions to the extent necessary to permit giving proper recognition for meritorious work in supporting the war effort, or cancel the awards entirely.

10. Announcement of the awards will be made as soon as practicable after the final date for filing.

CHECKING MEN IN

Speeded by Special Facilities at Summit

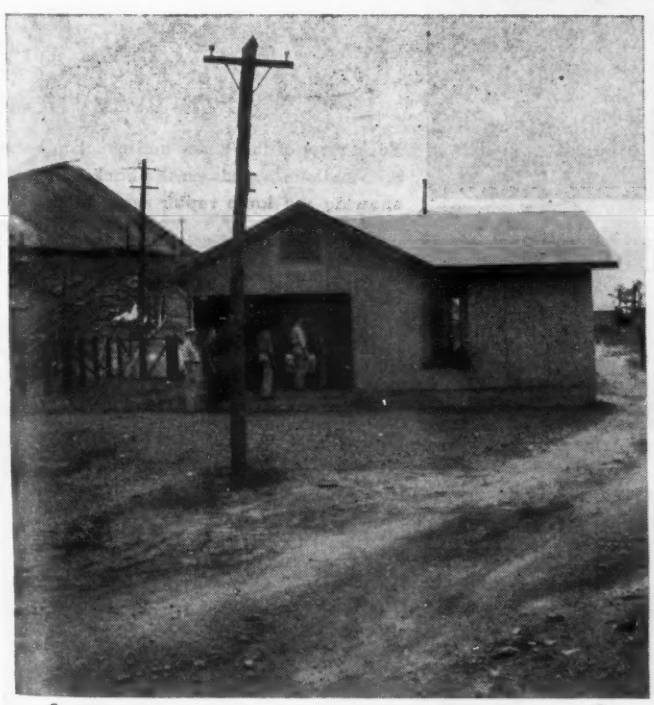
New Lamphouse and Check-In Station Includes Guide Fences and Time Clocks to Facilitate Starting Men Into Mine — Special Provisions Are Made to Advise Men When Their Places Are Not Ready

AMONG those organizations that have studied the problem of checking men in and getting them started into the mine with a minimum loss of time, milling around and uncertainty is the Alta Coal Division of the Southern Cotton Oil Co., operating the Summit mine at Sumiton, Ala. As a result of its investigations the management built a new lamphouse and check-in station to reduce confusion and speed the process of getting the men started to their working places.

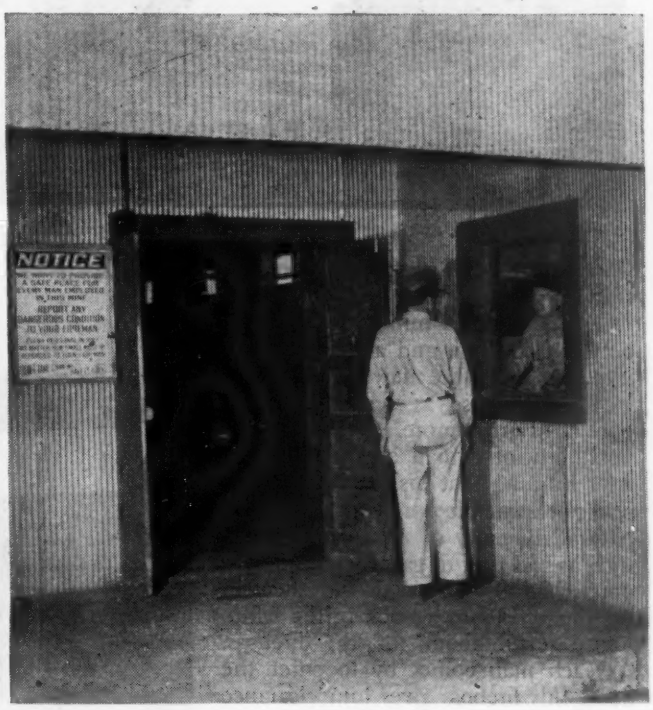
Alta Coal Co. officials in front of the new lamp- and check-in-house. Left to right: A. C. Murray, superintendent; I. S. Gillespie, chief mining engineer (now with another company); J. K. Johnston, mine foreman; J. S. Edgil, chief electrician; and G. W. Moore.

Slope Opening Used

Summit mine recovers the 25-in. Black Creek seam in Walker County. The men enter and leave via the main slope, fitted for rope haulage for ¾ mile. Locomotives handle gathering and main-line haulage to the slope bottom. With some 270 employees, daily capacity of the mine is 550 tons,



Men filing by the fireboss' window and into the lamphouse to check in. The house is between the road and the main slope.



Fireboss tells man that water in his place will keep him from checking in but that he will be able to go in the next day.

Fences direct the men to the track leading down the slope.

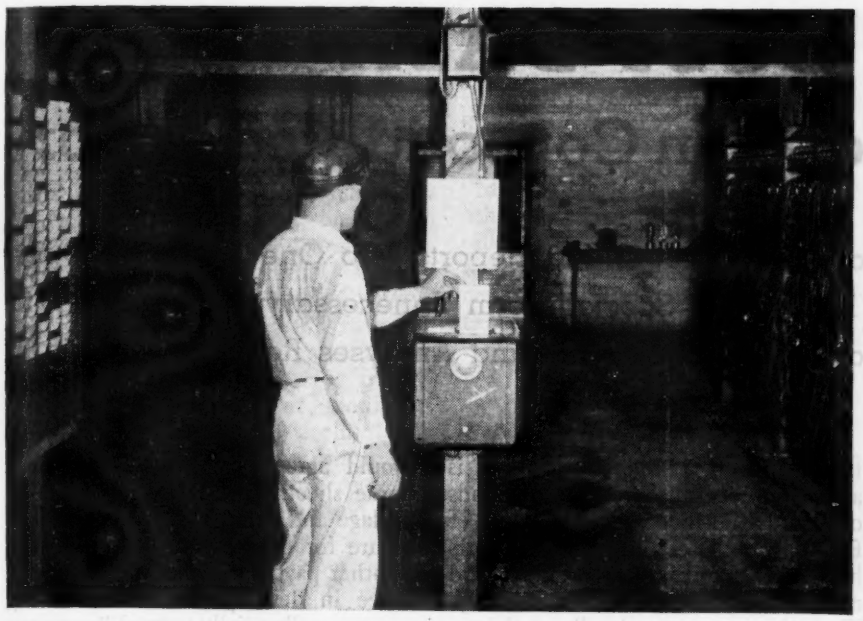
Showing the lamphouse location and fencing in relation to the main slope.

Back view of the lamp- and check-in house with bulletin boards on the back porch and showing the lamp repair wing at the left.

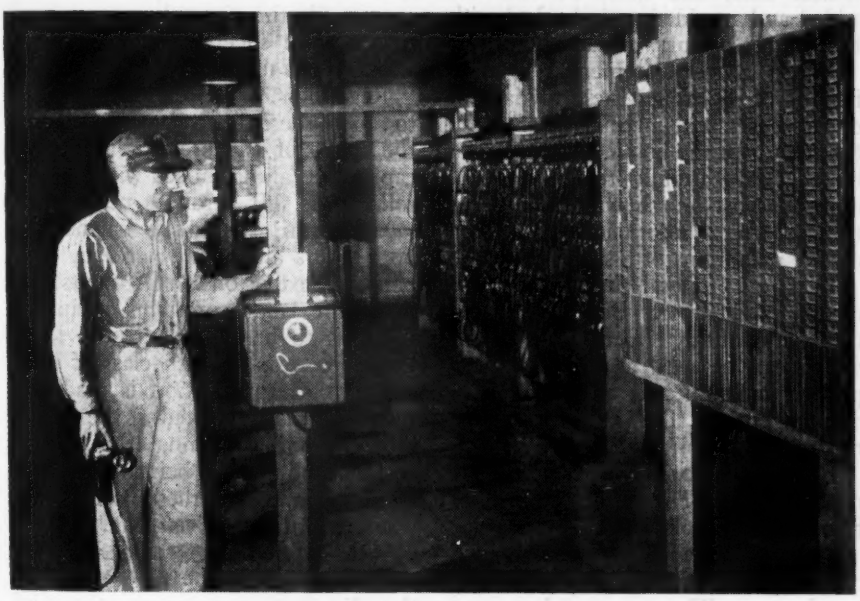
working one full shift and one part shift.

To reduce to a minimum the time between check-in and actual entrance into the mine the new building was located as close as possible to the portal. Furthermore, to obviate the possibility of a man checking in and later learning that his place or section was not available for work, due to a natural difficulty or unsafe condition, such as bad roof or gas, the lamphouse porch has a window on the check-in side opening into a nook in the lamphouse repair room for the fireboss. As each man comes by to enter the door, this fireboss gives him clearance for his working place.

The lamp- and check-in house, as indicated in the accompanying illustrations, is located between the road



Checking in before taking the lamp from the self-service racks.



Checking out at the other end of the lamphouse at the end of the day. If an injury is reported the clock starts a bell to ringing. On the way through the house the workman will place his lamp in the self-service charging rack.

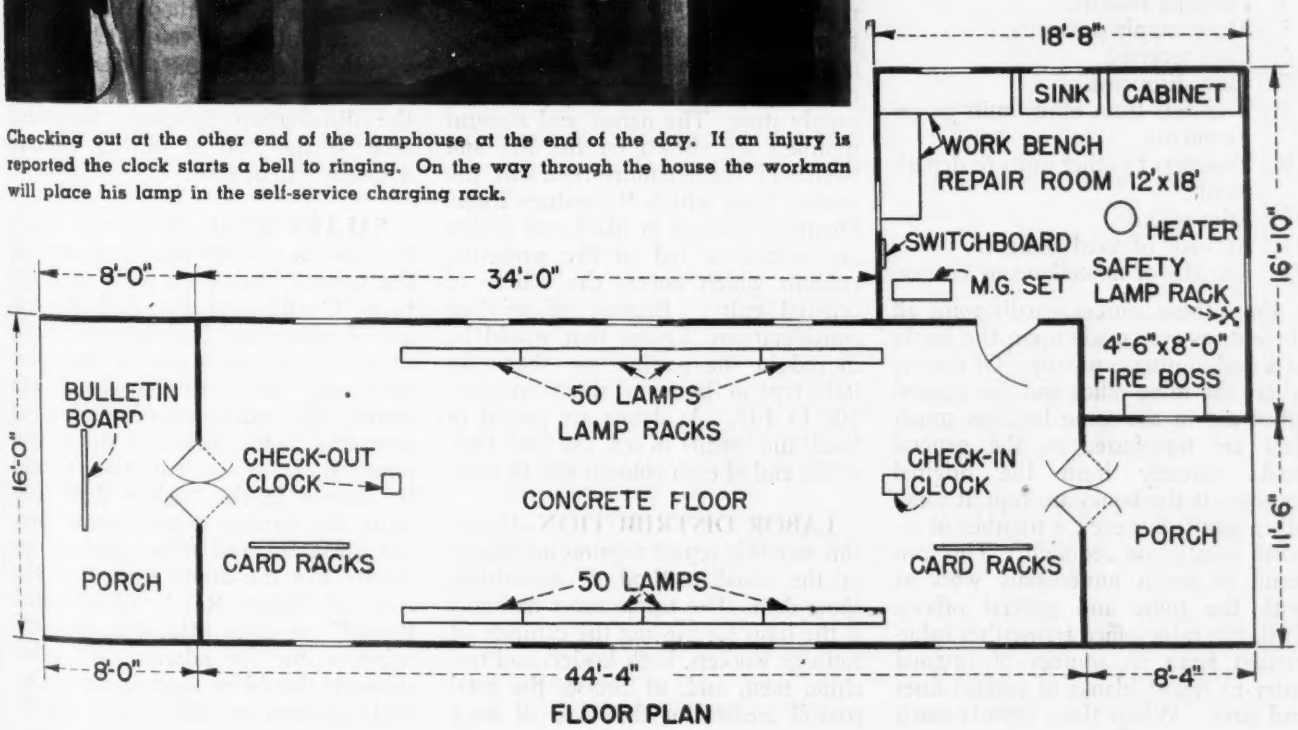
and the slope track leading down into the cut to the portal. Fences direct the men through the building and then from the back porch to the track serving the slope. The main room containing the lamps and time clocks is 16x44 ft. 4 in.; the repair room wing, 12x18 ft. and the fireboss' nook with window opening to the front porch, 4½x8 ft. The rear porch, where the bulletin board is mounted, is 8x16 ft. Construction is wood framing with corrugated steel covering. Inside walls and ceilings are sealed.

Bell Signals Injury

Time clocks (International) include mechanisms and bells for reporting personal injuries. The bell continues to ring until the foreman or other official in charge of the lamphouse stops it. Thus, he is apprised immediately of the injury and can notify the company doctor or take other suitable action. Every man on the job—underground and outside—excepting mine officials and employees of the commissary, check in through this lamphouse.

Lamp equipment consists of 300 Wheat Model GW lamps with self-service charging racks. The motor-generator set and control board are in the repair room, which is stove-heated and includes a sink, work benches, cabinets and a safety-lamp rack.

Floor plan of self-service lamphouse and check-in station at Summit mine.



FLOOR PLAN

MONTHLY COST DATA
Made More Usable in Consolidated Report

Consolidation of Mine Records and Reports Into One "Monthly Operating Report" Proposed — Special Form Unnecessary — Time Spent in Preparing Special Cost Statements and Analyses Reduced Materially

By JNO. C. McNEIL
Certified Public Accountant
Wheelwright, Ky.

THE IMPORTANCE of the local accountant in the average coal mine set-up is something too seldom appreciated. Many reports are required which entail considerable work in the mine office, and this work is repeated when the reports reach the principal offices. In many instances so many reports are required that an elaborate index is necessary.

Normally there are only twelve sources for all entries upon the books of any mining company, whether it operates one mine or twenty. These are:

1. Payroll earnings, or labor distribution.
2. Salaries.
3. Collections from employees over payrolls.
4. Purchase records.
5. Mine supply accounts.
6. Cash received.
7. Cash disbursed.
8. Transfers from other units or departments.
9. Transfers to other units or departments.
10. Sales records.
11. Accruals of fixed charges.
12. Journals of miscellaneous entries.

From these sources usually come all the entries ever made upon the books of a coal-mining company. Of course, where the mine office and the general office are in the same location much data are transferred to the general books directly from the original sources. If the books are kept at some other point, however, a number of reports usually are required. This can result in much unnecessary work at both the mine and general offices. First, the mine office transcribes information from its sources of original entry to report blanks of various hues and sizes. When these reports reach the main office the information is again transcribed onto various kinds of records and then posted to books of final entry. These entries and reports have to be added and re-added and checked and re-checked for accuracy. Then the management calls on the accounting department for cost and statistical data, and these in turn are added and re-added and checked with the sources of entry at each point.

When a cost statement is wanted for one of the mines these myriads of entries necessitate an analysis of either the reports or the books, and this must be checked carefully to see that all items of cost are shown. The same thing is true if information is wanted on the operations of a store, etc.

It is my proposal that all of these records and reports be consolidated into a "Monthly Operating Report" which can be used as a report, as a posting medium and as the book of original entry. The idea for such a report is not original.

Elaborate special ruled forms are not necessary. The form used in illustrating this article is based on a 13-column accountant's work sheet which can be purchased from any stationery supply store. The names and account numbers are shown on the left and twelve of the columns represent the sources from which the entries come. Debits are posted in black and credits are posted in red in the particular column which covers the source of original entry. Because of printing considerations, figures that would be in red in the original are shown in *italic* type in the report sheets on pages 106 to 109. As debits are posted in black and credits in red, the final total at the end of each column will be zero.

LABOR DISTRIBUTION—Use of this monthly report requires no change in the usual method of assembling these data. The tipple sheet naturally is the basis for posting the earnings of tonnage workers, both loaders and machine men, and, of course, the total payroll credits for this class of work should agree with the total of the tipple sheet. The same is true as to yardage and other allowances of every nature for dead work, driving entries or other payments based upon the advance in development. As to daily workers, colloquially termed "company men," it likewise is true that the total time shown on the payroll should agree with the time shown on time-books, time sheets or clock cards—whichever is used.

Regardless of the method now used to report these data to the main office, the items of expense have to be recapitulated and balanced with the payroll credits. It hardly is necessary to say that this should be balanced in both hours and money and by independent extensions. Of course, to know the labor costs this recapitulation has to be by accounts to reveal the labor costs on each class of work. After this recapitulation is made the various items are posted in the "Labor Distribution" column, the various cost account items being debited in black ink and "Accrued Payrolls," or whatever title is given the account, credited in red ink (*italic* figures in the illustration with this article). If the distribution balances, the final total at the bottom of the column naturally will be zero.

SALARY ROLL—It is pretty much the practice to keep salaries apart from the general payroll on what amounts to a "Confidential Payroll." Regardless of where and how they are kept, such expenses are a part of the mine costs .and have to be distributed among the mine operating expenses according to the nature of the service rendered. Such distribution should be entered in the "Salary Roll" column, the various debits spread over the operating and other expense accounts and the credit posted to the credit of "Salary Roll," "Confidential Payroll" or other title indicating the balances due for salaries. The two accounts should be kept separate. Unpaid balances in either account, of

course, should be transferred to an "Unclaimed Wage" account, according to the practice of the company.

PAYROLL COLLECTIONS—Deductions from miners' earnings for rent, lights, advances in merchandise and other usual deductions made over the payrolls should be summarized and posted in this column. Collections made from the salary payroll also can be summarized and included here, debiting "Accrued Payrolls" for the total collections from the payroll and "Accrued Salaries" (or "Confidential Payroll") for that portion. As illustrated, the various earnings and credit accounts affected are credited and the payroll accounts debited.

Some companies issue scrip, in which event the scrip account would be credited with the amount issued over the payroll. Other companies run charge accounts, issuing credit authorization to the store department, and in this case the charges from the tickets turned in by the store would be entered on the payroll and the credits would be to the merchandise sales accounts. Others issue advances in cash, in which case the "Cash Issued," or other title used, would receive the credit.

PURCHASE RECORD — There are many variations in handling coal-company purchases. Mostly, the invoices are sent to the general office for credit and payment. When a company operates several mines the distribution of such invoices involves much work and a complete cost statement is impossible until the records have been posted and balanced.

Vendors' invoices are paid when the mine official charged with approving them passes on them. Sometimes they are approved and sent to the general office for entry and payment. In other cases, receiving reports are made out showing the receipt of the material and are matched with the vendor's invoice before entry is made upon the books. Regardless of the method used, it is the mine office that indicates the proper account to which *this* invoice should be charged. For proper record, it is essential that the invoices be sent to the general office with a letter of transmittal itemizing the invoices by dates, names of vendors and amounts. Only thus can any record be kept of invoices.

With a little additional work, the account number to which the particular invoice is to be charged can be entered on the letter of transmittal. By summarizing these transmittal letters at the close of each month, the mine office will have a complete summary of the invoices approved and submitted to the general office for entry and payment. This summary should be posted in the purchase record column, debiting the various accounts and crediting some clearing account, such as "Mine Office Vendors' Invoices" or other title. Then, when the general office vouchers the invoices for payment, the debits can be made to this clearing account instead of to many expense or merchandise accounts.

This procedure, of course, will do away with the analysis of purchase accounts in the general office to determine costs and other data. They already will have been analyzed and posted in the mine office record. Inasmuch as the invoices themselves have been listed on letters of transmittal, the total of the general office debit should agree exactly with the mine office credit and thus "wash out" the clearing account set up in the "Monthly Operating Report." The saving in time in this alone will more than pay the extra cost of this "Monthly Operating Report" form.

MINE SUPPLIES—It is assumed that the company operates a supply house and issues materials on properly approved requisitions. The important thing is to record the materials received, materials issued and the average price per unit. The requisitions should be priced and extended daily and arranged in account-number order. An adding machine tape listing the account numbers should be stapled securely to each requisition. The amounts from this tape should be posted daily to a work sheet showing the various account numbers. At the close of the month this work sheet should be added and summarized. The figures from this summary should be posted in the "Monthly Operating Report" to the debit of the various accounts affected, crediting "Mine Supply Account." This column will likewise work out to the zero.

The "Mine Supply Account" will be debited with receipts through the "Purchase Record" column and credited with issues through the "Mine Supply" column. The cost of labor for the supply warehouse will be debited to the "Mine Supply Account" from the "Labor Distribution" column, and any other items affecting the mine supply account will be posted from the other columns so the mine office will have a complete picture of the "Mine Supply Account" in one place, and only one place—the "Mine Supply Account" item in the "Monthly Operating Report." Elaborate detailed analyses to determine the status of mine supplies are unnecessary.

CASH RECEIVED—Little explanation of this account is necessary. It is obvious that cash receipts will be posted to the credit of the accounts affected by the receipts during the month. These receipts should be deposited daily or weekly, depending upon circumstances, intact, without any deduction or disbursement. By so doing all receipts can be traced into the bank. The month's receipts should agree with the month's bank deposits after considering, of course, items that lap over into the next month because it would not be possible to deposit the last day's receipts on the last day of the month. Payments of any nature should be made out of the "Mine Manager's Working Fund" or the "Petty Cash Account," which will be explained under the caption "Cash Disbursed."

CASH DISBURSED—This term has reference to payments made by the mine office. A bank account should be established as the "Mine Manager's Working Fund," or some other title, and payments out of this account should be made by check bearing the duly authorized signature or signatures. This fund should be established as an "imprest fund" with a fixed balance to be determined by the proper executive officers of the company. Weekly reports should be made to the general office of all disbursements so that the fund can be replenished. Entries in the "Cash Disbursed" column, debiting the various accounts and crediting the working fund, should be made from the summary of the cash disbursement book.

Payments of every kind, even payroll advances, should be made by check. A "Petty Cash Fund" should be set up with the cashier or other person, out of which small payments, such as postage, etc., can be made. Every disbursement out of the "Petty Cash Fund" should be supported by a "Petty Cash Voucher" properly approved. This fund also should be handled as an "imprest fund," which should be reimbursed from time to time so that it always will be the same. The cashier should be required to have this "Petty Cash Fund" in cash and properly approved petty cash vouchers at all times.

INTERPLANT TRANSFERS, INCOMING—A company having several mines will find it necessary to transfer materials, merchandise and equipment from one mine to another. This material should be moved on a transfer bill, properly authorized. The account will be quite active with some

How Operating Report Is Set Up in Mine Office

MONTHLY OPERATING REPORT — OPERATION No. 5 — Month of May, 1945

Sheet 1

A/C No.		Accounts	Labor Distribution	Salary Payroll	Payroll Collections	Purchase Records	Mine Supplies	Cash Received	Cash Disbursed	Interplant Inbound	Transfers Outbound	Sales Records	Reserves and Accruals	Journal Entries	GRAND TOTALS
1		Treasurer's Cash Account						403471.14							403471.14
2		Mine Manager's Working Fund						175690.64	*179444.28*						*3753.64*
3		Petty Cash Account						250.26	*250.26*						
								126.98	126.98						
4		Store and Office Change Funds													
5		Payroll Cash Retains	15624.85					*15624.85*							
6		Accounts Receivable — Coal Sales						*325050.40*				485294.95			160244.55
7		Accounts Receivable — Sundry						*1400.20*				1431.41			31.21
8		Notes Receivable													
9		Inventories—Merchandise													
10		Mine Supplies			*468.25*	32648.50	*50703.44*	*1264.80*		2826.42	*1258.26*	*298.50*			*18518.33*
11		Prepaid Expenses				1645.30							*496.31*		1148.99
12		Lands — Owned in Fee													
13		Mineral Rights													
14		Leasehold													
15		Machinery & Equipmen				5642.00									5642.00
16		Mine Buildings													
17		Tipple Structures													
18		Tenements													
19		Store and Office Buildings													
20		Clubhouse Buildings													
21		Construction in Process				1250.00									1250.00
	221	Clearing Account — Oper'n No. 1								*2248.50*	236.50				*2012.00*
	222	Clearing Account — Oper'n No. 2			*26.45*					*285.64*	124.86				*187.25*
	223	Clearing Account — Oper'n No. 3								*386.45*	1630.28				1243.83
	224	Clearing Account — Oper'n No. 4								*754.75*	596.80				*157.95*
	225	Clearing Account — Oper'n No. 5													
23		Clearing Account — General Office						*176690.54*		*40998.30*			*18480.00*		*235168.84*
	a	Payroll Overdrafts	260.70		*186.48*										83.22
25	a	Accrued Payrolls — Cr	*264487.80*												*264487.80*
	b	Accrued Payrolls — Dr			158623.40				142786.90						301410.30
26	a	Accrued Salaries — Cr		*13625.52*											*13625.52*
	b	Accrued Salaries — Dr			4648.52				4349.62						8998.14
27		Federal Tax Withholdings			*27811.33*										*27811.33*
28		F. O. A. B. Tax Liability			*2718.12*								*2718.12*		*5436.24*
29		Unemployment Tax Liability											*4892.16*		*4892.16*
30		Vendors A/C Pay. Clearing Acct				*146744.98*									*146744.98*
31		Compensation Liability				4238.64							*5289.64*		*1051.00*
32		Reserve for Depreciation											*16598.40*		*16598.40*
33		Reserve for Depletion											*250.00*		*250.00*
34		Taxes Accrued — Not Due											*1733.33*		*1733.33*
		Forwarded	*248593.25*	*13625.52*	132061.29	*101320.54*	*50703.44*	*60254.27*	*32431.04*	*41847.22*	1330.13	486427.86	*50457.96*		141094.63

Sheet 2

A/C No.		Accounts	Labor Distribution	Salary Payroll	Payroll Collections	Purchase Records	Mine Supplies	Cash Received	Cash Disbursed	Interplant Inbound	Transfers Outbound	Sales Records	Reserves and Accruals	Journal Entries	GRAND TOTALS
		Totals Brought Forward	*248593.25*	*13625.52*	132061.29	*101320.54*	*50703.44*	*60254.27*	*32431.04*	*41847.22*	1330.18	486427.86	*50457.96*		141094.63
40	a	Coal Sales — General										*462598.70*			*462598.70*
	b	Coal Sales — Employees			*982.50*							*258.20*		*50.00*	*1290.70*
	c	Coal Sales — Railway Fuel										*22696.25*			*22696.25*
41	a	Merchandise Sales — Unit 1			*48326.90*			*32486.41*				*318.24*			*81131.55*
	b	Merchandise Sales — Unit 2			*32586.40*			*25686.40*				*268.65*			*58541.45*
42		Tenement Rentals			*7692.40*										*7692.40*
43		Other Rentals												*250.00*	*250.00*
44		Miscellaneous Sales													
	a	Lights			*1264.80*							*128.60*		1393.40	
	b	Light Tax			*37.94*							*3.87*			*41.81*
	c	Clubhouse			*3682.50*			*396.40*				*123.55*			*4207.45*
45	a	Merchandise Purchases — Unit 1				38646.40				425.60	*964.81*				38107.19
	b	Merchandise Purchases — Unit 2				42964.83				423.32	*365.37*				43022.78
46		Sundry Payroll Collections													
	a	Medical Service			*1826.40*				1532.84						*293.56*
	b	Hospital Service			*913.28*				845.62						*67.66*
	c	Burial Funds			*638.42*				625.60						*12.82*
	d	Union Dues and Collections			*3765.00*				3600.00						*165.00*
	e	Temporary Cash Advances			*926.45*				926.45						
	f	Insurance			*1526.48*				1513.42						*13.06*
	g	Other Collections													
47		Employes Bond Purchases			*27696.40*			*1276.00*	22750.00						*6122.40*
		Forwarded	*248593.25*	*13625.52*	295.42	*19709.31*	*50703.44*	*409.06*	*687.11*	*40998.30*		26.80	*50457.96*	1093.40	*422900.21*

A/C No.		Accounts	Labor Distribution	Salary Payroll	Payroll Collections	Purchase Records	Mine Supplies	Cash Received	Cash Disbursed	Interplant Transfers Inbound	Interplant Transfers Outbound	Sales Records	Reserves and Accruals	Journal Entries	GRAND TOTALS
	g	Other Collections	.....	.....	*27696.40*	.....	.....	*1276.00*	22750.00	.....	.....	.....	.....	.....	*6122.40*
47		Employes Bond Purchases	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
		Forwarded	*248593.25*	*13625.52*	295.42	*19709.31*	*50703.44*	*409.06*	*637.11*	*40998.30*	.....	26.80	*50457.96*	1093.40	*422900.21*

Sheet 3

A/C No.		Accounts	Labor Distribution	Salary Payroll	Payroll Collections	Purchase Records	Mine Supplies	Cash Received	Cash Disbursed	Interplant Transfers Inbound	Interplant Transfers Outbound	Sales Records	Reserves and Accruals	Journal Entries	GRAND TOTALS
		Totals Brought Forward	*248593.25*	*13625.52*	295.42	*19709.31*	*50703.44*	*409.06*	*637.11*	*40998.30*	.....	26.80	*50457.96*	1093.40	*422900.21*
5	51	HAND LOADING 64,210 Tons													
	a	Cutting	7999.20	.....	.....	.....	1276.41	.....	.....	.....	.....	.....	.....	.....	9275.61
	ar	Repairs to Mining Machines	397.65	.....	.....	295.42	1057.60	.....	.....	.....	.....	.....	.....	.....	1750.67
	b	Loading	54327.90	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	54327.90
	c	Pick Loading	3936.35	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3936.35
	d	Yardage	1826.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1826.50
	e	Timbering	1796.80	.....	.....	.....	2324.36	.....	.....	.....	.....	.....	.....	.....	4121.16
	f	Tracks	1526.96	.....	.....	.....	1528.32	.....	.....	.....	.....	.....	.....	.....	3055.28
	g	Gathering Locomotives	4686.94	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4686.94
	gr	Repairs to Locomotives	416.96	.....	.....	.....	1236.40	.....	.....	.....	.....	.....	.....	.....	1653.36
	h	Section Foremen	3167.25	378.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3545.25
	j	Removal of Debris	486.10	.....	.....	.....	426.42	.....	.....	.....	.....	.....	.....	.....	912.52
	k	Tools	.....	.....	.....	.....	376.81	.....	.....	.....	.....	.....	.....	.....	376.81
	m	Miscellaneous	325.20	.....	.....	.....	922.60	.....	.....	.....	.....	.....	.....	.....	1247.80
		TOTAL 551 — HAND LOADING	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	90716.15
5	52	CONVEYOR LOADING 36,390 Tons													
	a	Cutting	2647.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2647.25
	ar	Repairs to Mining Machines	398.24	.....	.....	162.48	1264.50	.....	.....	.....	.....	.....	.....	.....	1825.22
	b	Loading	34784.96	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	34784.96
	c	Gathering Locomotives	1582.60	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1582.60
	d	Moving Conveyors	1826.42	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1826.42
	e	Timbering	1546.80	.....	.....	.....	2786.98	.....	.....	.....	.....	.....	.....	.....	4333.78
	f	Explosives	1204.61	.....	.....	.....	1680.42	.....	.....	.....	.....	.....	.....	.....	2885.03
	g	Ventilation	367.26	.....	.....	.....	1271.00	.....	.....	.....	.....	.....	.....	.....	1638.26
	h	Section Foremen	2520.98	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2520.98
	k	Tools	.....	.....	.....	.....	438.20	.....	.....	.....	.....	.....	.....	.....	438.20
	m	Miscellaneous	126.10	.....	.....	.....	346.68	.....	.....	.....	.....	.....	.....	.....	472.78
		TOTAL 552 CONVEYOR LOADING	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	54955.48
5	53	MOBILE LOADING MACHINE 54,200 Tons													
	a	Cutting	3925.42	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3925.42
	ar	Repairs to Cutting Machines	259.24	.....	.....	.....	148.95	.....	.....	.....	.....	.....	.....	.....	408.19
	b	Loading	46392.40	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	46392.40
	c	Gathering Locomotives	2175.84	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2175.84
	cr	Repairs to Gathering Locomotives	726.94	.....	.....	.....	1845.64	.....	.....	.....	.....	.....	.....	.....	2572.58
	d	Tracks	1256.80	.....	.....	.....	2648.60	.....	.....	.....	.....	.....	.....	.....	3905.40
	e	Timbering	475.68	.....	.....	.....	2786.90	.....	.....	.....	.....	.....	.....	.....	3262.58
	f	Explosives	1278.25	.....	.....	.....	1248.70	.....	.....	.....	.....	.....	.....	.....	2526.95
	g	Ventilation	462.34	.....	.....	.....	1127.60	.....	.....	.....	.....	.....	.....	.....	1589.94
	h	Section Foremen	3126.40	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3126.40
	k	Tools	.....	.....	.....	.....	478.35	.....	.....	.....	.....	.....	.....	.....	478.35
	m	Miscellaneous	152.64	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	152.64
		TOTAL 553 M.L.M. LOADING	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	70516.69
		TOTAL MINING COSTS 154,800 Tons	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	(General Ledger Posting)		216188.32
		Forwarded	*60462.27*	*13247.52*	295.42	*19251.41*	*23482.00*	*409.06*	*637.11*	*40998.30*	.....	26.80	*50457.96*	1093.40	*206711.89*

Sheet 4

A/C No.		Accounts	Labor Distribution	Salary Payroll	Payroll Collections	Purchase Records	Mine Supplies	Cash Received	Cash Disbursed	Interplant Transfers Inbound	Interplant Transfers Outbound	Sales Records	Reserves and Accruals	Journal Entries	GRAND TOTALS
		Totals Brought Forward	*60462.27*	*13247.52*	295.42	*19251.41*	*23482.00*	*409.06*	*637.11*	*40998.30*	.....	26.80	*50457.96*	1093.40	*206711.89*
54	a	Main Line Locomotives	10256.42	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10256.42
	ar	Repairs to Locomotives	1023.40	.....	.....	.....	1246.95	.....	.....	.....	.....	.....	.....	.....	2270.35
	b	Tracks	1428.65	.....	.....	.....	1596.45	.....	.....	.....	.....	.....	.....	.....	3025.50
	c	Wiring and Bonding	1264.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1264.10
	d	Mine Cars	1678.56	.....	.....	.....	1278.60	.....	.....	.....	.....	.....	.....	.....	2957.16
	e	Signals	202.41	.....	.....	.....	524.30	.....	.....	.....	.....	.....	.....	.....	726.71
	f	Cleaning Tracks	1828.42	.....	.....	.....	126.70	.....	.....	.....	.....	.....	.....	.....	1955.12
	g	Grading	126.80	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	126.80
	h	Drying Sand	352.86	.....	.....	.....	264.70	.....	.....	.....	.....	.....	.....	.....	617.56
	k	Tools	.....	.....	.....	.....	82.45	.....	.....	.....	.....	.....	.....	.....	82.45
	m	Miscellaneous	124.31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	124.31
		TOTAL 54 HAULAGE	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	23406.48
55	a	Timbering Headings	4126.48	.....	.....	.....	4568.32	.....	.....	.....	.....	.....	.....	.....	8694.80
	b	Miscellaneous	1232.45	.....	.....	.....	1264.30	.....	.....	.....	.....	.....	.....	.....	2496.75
		TOTAL 55 Timbering	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11191.55
56	a	Fans	236.45	.....	.....	.....	226.40	.....	.....	.....	.....	.....	.....	.....	462.85
	b	Brattices and Doors	1684.26	.....	.....	.....	127.85	.....	.....	.....	.....	.....	.....	.....	1812.11
	c	Overcasts	567.48	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	567.48
	d	Cleaning Air Ways	1232.41	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1232.41
	e	Miscellaneous	162.42	.....	.....	.....	122.30	.....	.....	.....	.....	.....	.....	.....	284.72
		TOTAL 56 VENTILATION	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4359.57

Sheet 4 (continued)

A/C No.		Accounts	Labor Distribution	Salary Payroll	Payroll Collections	Purchase Records	Mine Supplies	Cash Received	Cash Disbursed	Interplant Transfers Inbound	Interplant Transfers Outbound	Sales Records	Reserves and Accruals	Journal Entries	GRAND TOTALS
57	a	Pumps	1264.82												1264.82
	ar	Repairs to Pumps	462.75				562.80								1025.55
	b	Pipe Lines	1245.28				1250.26								2495.54
	c	Drain Ditches and Sumps	254.60												254.60
	d	Miscellaneous	37.25				36.80								74.05
		TOTAL 57 DRAINAGE													5114.56
58	a	Cap and Safety Lamps	236.42				976.40		248.50						1461.32
	b	First Aid and Safety	128.72	468.50			136.40								733.62
	c	Inspection	758.62	468.50											1227.12
	d	Shelter Holes	128.21												128.21
	e	Fire Apparatus	246.82				27.85								274.67
	f	Rock Dusting	564.38				648.70								1213.08
	g	Miscellaneous	29.40				32.60								62.00
		TOTAL 58 SAFETY													5100.02
59	a	Mine Foremen		2832.40											2832.40
	b	Lighting	126.42												126.42
	c	Telephones	38.24				127.65								165.89
	d	Rock Work	3146.84				1264.70								4411.54
	e	Air Compressors and Drills	682.40												682.40
	f	Man Trips	1264.30												1264.30
	g	Supply Crews	2764.80												2764.80
	h	Miscellaneous	128.40				328.60		32.86						489.86
		TOTAL 59 GENERAL UNDERGROUND													12737.91
		TOTAL UNDERGROUND												(General Ledger Posting)	61909.79
		Forwarded	*19425.32*	*9478.12*	295.42	*19251.41*	*6659.92*	*409.06*	*355.75*	*40998.30*		26.80	*50457.96*	*1073.40*	*144802.10*

Sheet 5

A/C No.		Accounts	Labor Distribution	Salary Payroll	Payroll Collections	Purchase Records	Mine Supplies	Cash Received	Cash Disbursed	Interplant Transfers Inbound	Interplant Transfers Outbound	Sales Records	Reserves and Accruals	Journal Entries	GRAND TOTALS
		Totals Brought Forward	*19425.32*	*9478.12*	295.42	*19251.41*	*6659.92*	*409.06*	*355.75*	*40998.30*		26.80	*50457.96*	1093.40	*144802.10*
60		TIPPLE													
	a	Weighing	696.24												696.24
	b	Dumping	849.68				275.25								1124.93
	c	Mine-Car Cleaning	1246.84				75.64								1322.43
	d	Cleaning Plant	684.30				128.70								813.00
	e	Slate and Rock Disposal	1264.28				56.26								1320.54
	f	Picking Tables	832.40				72.30								904.70
	g	R.R. Car Loading & Cleaning	1269.60				52.80								1322.40
	h	Repairs to Tipple Buildings	125.62				127.50								253.12
	j	Repairs to Tipple Equipment	648.60				1251.61								1900.21
	k	Supervision	432.48	368.00											800.48
	l	Inspection	357.24												357.24
	m	Miscellaneous	86.30				62.40								148.70
		TOTAL 60 TIPPLE													10964.14
61		SHOP													
	a	Machinists	968.42												968.42
	b	Smithing	972.41				128.40								1100.81
	c	Machinery and Tools	128.64				678.40								807.04
	d	Supervision and Timekeeping	248.30	525.60											773.90
	e	Miscellaneous	125.60				32.50								158.10
		TOTAL 61 SHOP													3808.27
62		LIGHT AND POWER													
	a	Electric Current Purchased				7265.86								*2290.05*	4975.81
	b	Sub Station Equipment	248.22	278.42		1526.94	326.78								2380.36
	c	Power Lines	678.64				264.70								943.34
	d	Transformers	232.80			1526.84	128.50								1888.14
	e	Miscellaneous	52.60				27.50								80.10
		Total 62 POWER COSTS													10267.75
63		YARDS, TRACKS & BUILDINGS													
	a	Repairs to Mine Buildings	326.94				152.30								479.24
	b	Railroad Tracks	328.62			1238.52	78.40								1645.54
	c	Hauling Supplies	1264.20				342.50								1606.70
	d	Grading	62.40												62.40
	e	Miscellaneous	56.80				32.54								89.34
		TOTAL 63 Y, T & B													3883.22
64		SUPERVISION													
	a	Management Salaries		2687.25											2687.25
	b	Engineering	468.30	562.80		348.60									1379.70
	c	Accounting — Local	126.45	1265.25											1391.76
	d	Supply House Labor & Expense	325.82				38.50								364.32
	e	Mine Office Expense					76.40		224.70						301.20
	f	Stationery & Printing				686.45									686.45
	g	Telegraph & Telephone	126.40		*295.42*	786.40	122.50	*126.40*	38.25			*26.80*			624.93
	h	Miscellaneous	82.50				13.00	*32.40*							63.10
															7498.65

A/C No.		Accounts	Labor Distribution	Salary Payroll	Payroll Collections	Purchase Records	Mine Supplies	Cash Received	Cash Disbursed	Interplant Transfers Inbound	Interplant Transfers Outbound	Sales Records	Reserves and Accruals	Journal Entries	GRAND TOTALS
	c	Supply House Labor & Expense	325.82				76.40		224.70						626.40
	d	Mine Office Expense											26.80		624.93
	e	Stationery & Printing				686.45									63.10
	f	Telegraph & Telephone	126.40		295.42	786.40	122.50	126.40	38.25						
	g	Miscellaneous	82.50				13.00	32.40							7498.65

A/C No.		Accounts	Labor Distribution	Salary Payroll	Payroll Collections	Purchase Records	Mine Supplies	Cash Received	Cash Disbursed	Interplant Transfers Inbound	Interplant Transfers Outbound	Sales Records	Reserves and Accruals	Journal Entries	GRAND TOTALS
		Totals Brought Forward	4107.69	3790.60	.....	5871.80	2114.54	250.26	92.80	40998.30	.....	.....	50457.96	1196.65	108380.07
65		ADMINISTRATIVE EXPENSE													
	a	Administrative Salaries	.....	.....	.....	.....	.....	.....	.....	1250.00	.....	.....	.....	.....	1250.00
	b	Clerical Salaries	.....	.....	.....	.....	.....	.....	.....	250.00	.....	.....	.....	.....	250.00
	c	Administrative Expenses	.....	.....	.....	.....	.....	.....	.....	375.26	.....	.....	.....	.....	375.26
	d	Legal Expense	.....	.....	.....	.....	.....	.....	.....	128.00	.....	.....	.....	.....	128.00
	e	Auditing Expense	.....	.....	.....	.....	.....	.....	.....	250.00	.....	.....	.....	.....	250.00
	f	Miscellaneous	.....	.....	.....	.....	.....	.....	.....	318.25	.....	.....	.....	.....	318.25
		TOTAL 65 ADMINISTRATIVE	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2571.51
66		SALES EXPENSE													
	a	Sales Commissions	.....	.....	.....	.....	.....	.....	.....	36907.89	.....	.....	.....	.....	36907.89
	b	Salaries and Wages	.....	.....	.....	.....	.....	.....	.....	1250.00	.....	.....	.....	.....	1250.00
	c	Other Sales Expenses	.....	.....	.....	.....	.....	.....	.....	268.90	.....	.....	.....	.....	268.90
		TOTAL 66 SALES	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	38426.79
67		FIXED CHARGES													
	a	Royalty	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15480.00	.....	15480.00
	b	Depletion	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	250.00	.....	250.00
	c	Depreciation	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15698.40	.....	15698.40
	d	Social Security Taxes	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2718.12	.....	2718.12
	e	Unemployment Ins. Taxes	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4892.16	.....	4892.16
	f	Property Taxes	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1526.80	.....	1526.80
	g	Fire Insurance	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	396.40	.....	396.40
	h	Liability Insurance	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	45.68	.....	45.68
	j	Workmen's Compensation Costs	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5289.64	.....	5289.64
	k	Vacation Expenses	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3000.00	.....	3000.00
	l	Miscellaneous	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
		TOTAL 67 FIXED CHARGES	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	49297.20
		TOTAL OUTSIDE COSTS	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	(General Ledger Posting)		24717.03
68		TENEMENT EXPENSE													
	a	Operating Labor and Supplies	262.96	250.00	.....	.....	126.22	.....	.....	.....	.....	.....	.....	.....	639.18
	b	Repair Labor and Supplies	1468.72	.....	.....	1526.90	1205.00	.....	.....	.....	.....	.....	.....	.....	4200.62
	c	Camp Lighting	126.45	.....	.....	.....	105.62	.....	.....	.....	.....	.....	.....	336.45	568.52
	d	Maintenance Walks and Streets	624.50	.....	.....	.....	278.40	.....	.....	.....	.....	.....	.....	.....	902.90
	e	Taxes	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	125.93	.....	125.93
	f	Insurance	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	29.63	.....	29.63
	g	Depreciation	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	600.00	.....	600.00
	h	Other Tenement Expense	78.00	.....	.....	.....	29.30	.....	.....	.....	.....	.....	.....	.....	107.30
		TOTAL 68 TENEMENT EXPENSE	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	(General Ledger Posting]		7174.08
69		CLUBHOUSE OPERATION													
	a	Salaries and Wages	426.40	250.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	676.40
	b	Food Supplies	.....	.....	.....	1892.60	.....	250.26	.....	.....	.....	.....	.....	.....	1642.34
	c	Other Supplies	.....	.....	.....	268.40	122.30	.....	.....	.....	.....	.....	.....	.....	390.70
	d	Repairs and Maintenance	122.41	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	122.41
	e	Light, Heat & Power	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	124.60	124.60
	f	Other Expenses	25.00	.....	.....	32.00	.....	.....	.....	.....	.....	.....	28.60	100.00	185.60
		TOTAL 69 CLUBHOUSE OPERATION	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	(General Ledger Posting)		3019.64
		Forwarded	973.24	3290.60	.....	2151.90	247.70	.....	92.80	.....	.....	.....	376.60	635.60	7768.44

Sheet 6

A/C No.		Accounts	Labor Distribution	Salary Payroll	Payroll Collections	Purchase Records	Mine Supplies	Cash Received	Cash Disbursed	Interplant Transfers Inbound	Interplant Transfers Outbound	Sales Records	Reserves and Accruals	Journal Entries	GRAND TOTALS
		Totals Brought Forward	973.24	3290.60	.....	2151.90	247.70	.....	92.80	.....	.....	.....	376.60	635.60	7768.44
71		GROCERY EXPENSES													
	a	Supervision and Accounting	.....	368.20	.....	.....	121.30	.....	.....	.....	.....	.....	.....	.....	489.50
	b	Clerical Help	948.64	2922.40	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3871.04
	c	Supplies and Expenses	.....	.....	.....	1526.30	126.40	.....	92.80	.....	.....	.....	.....	.....	1745.50
	d	Rental of Space Occupied	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	150.00	150.00
	e	Repairs and Renewals — Equipt	.....	.....	.....	625.60	.....	.....	.....	.....	.....	.....	.....	.....	625.60
	f	Depreciation — Equipment	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	300.00	.....	300.00
	g	Light, Heat & Power	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	485.60	485.60
	h	Taxes	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	52.00	.....	52.00
	j	Insurance	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	24.60	.....	24.60
	k	Miscellaneous Expenses	24.60	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	24.60
		TOTAL 71 GROCERY EXPENSES	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	(General Ledger Posting)		7768.44

Sheet 7

NOTE: Commissary Department can be broken down into other departments, such as "72, butcher shop"; "73, hardware department"; "74, dry goods department"; "75, drinks and drug sundries," etc. If, however, it is not desired to departmentalize the mercantile department to such an extent, the above chart can be applied to the department as a whole.

companies and inactive with others. If, for example, a company has five separate operations, "Operating Clearing Accounts" should be set up in each "Monthly Operation Report" as follows:

Operation Clearing A/C No. 1, etc.

To illustrate the handling of such transfers, say Mine No. 1 has transferred $500 worth of materials to Mine No. 5. The "Monthly Operating Report" of Mine No. 1 will then include an entry charging "Operation Clearing A/C No. 5" with the $500 and crediting the various items of expense, mine supplies or others as necessary. The contra entry will appear on the "Monthly Operating Report" for Mine No. 5 debiting $500 to the appropriate accounts and crediting "Operation Clearing A/C No. 1" with the same amount.

These "Operation Clearing Accounts" will wash each other out on the general books and leave the debits and credits in the appropriate expense and other accounts of the various operations affected. These transfers can be made and accounted for between the operations affected without requiring any bookkeeping on the part of the general office, and yet the results will finally appear on the general books the same as though an elaborate set of bookkeeping entries had been made.

All incoming transfers between operations should be handled through this column.

INTERPLANT TRANSFERS, OUTGOING—The remarks about incoming transfers apply with equal force to this column. The only reason for separating the two is to make the accounting less complicated, since there are certain transfers between the mines and the stores and the stores and the mines that will come up from time to time. It is immaterial through which of these accounts they are handled. However, to simplify the accounting it should be ruled that all issues of material of any kind from the stores should go through the warehouse. In other words, if material is wanted that is not in stock in the warehouse, the warehouse should ask the store for a transfer of the material. Thus, all supplies issued to the mine, regardless of the source, would be cleared through the "Mine Supply Account."

SALES RECORDS—Some companies have their sales agents send orders to the mines priced; others unpriced so that coal sales are invoiced from the general office. There is no reason why the mine office should not make the invoices for the coal sales too, since only a little additional work is required. The sales could be summarized and posted through this sales column, debiting "Accounts Receivable" and crediting the various "Coal Sales Accounts."

There are miscellaneous items of sales, such as supplies, electric current, etc., for which miscellaneous invoices are rendered. Such sales should not be included in general accounts receivable but should be charged to "Miscellaneous Accounts Receivable" and a ledger kept at the mines on such accounts.

A number of companies sell furniture, clothing and other material on what is generally called "Lease Accounts" (because of legal phraseology in the bill of sale), and these accounts should be handled in this manner. Merchandise sales would receive credit and "Miscellaneous Accounts Receivable" would be debited.

RESERVES—This column should take care of the monthly charges for depletion, taxes, insurance, compensation and any other fixed charges applicable to expenses. The general office should furnish the mine office with a schedule of such monthly charges and advise them of any changes. These items should be summarized monthly and the appropriate debits made to the expense accounts involved, with the contra credits to the proper reserve and accrual accounts.

JOURNALS—In all accounting work the necessity for adjustments often arises and, of course, these cannot be foreseen and provided for. For this reason the "Journal" column is provided. Appropriate journal vouchers should be drawn up for adjustments found necessary either by the mine office or the general office. Supporting papers authorizing or giving reasons for the adjustments should be attached to the journal vouchers. After the journal vouchers are summarized, appropriate debit and credit entries are made in this column. The journal vouchers themselves should be filed for future reference and proper approvals should be secured for each journal voucher before summarizing.

THE MONTHLY REPORT—Each of the columns referred to in the twelve preceding titles has the debits in black ink and the credits in red (*italic* figures in the illustration material), so that these columns add down to a zero balance. If there is a black or red figure left in the addition of any column, an error has been made and should be sought out and corrected before leaving the work. Each column coming down to zero will show that all the work is in balance. Then each line is added across the form and the net result—black or red—is entered in the "Grand Total" column. This column also should be added down to a zero balance. When this is done, all the accounting of every nature has been done in the mine office and the "Monthly Operating Report" becomes exactly what its title indicates. No other report is necessary.

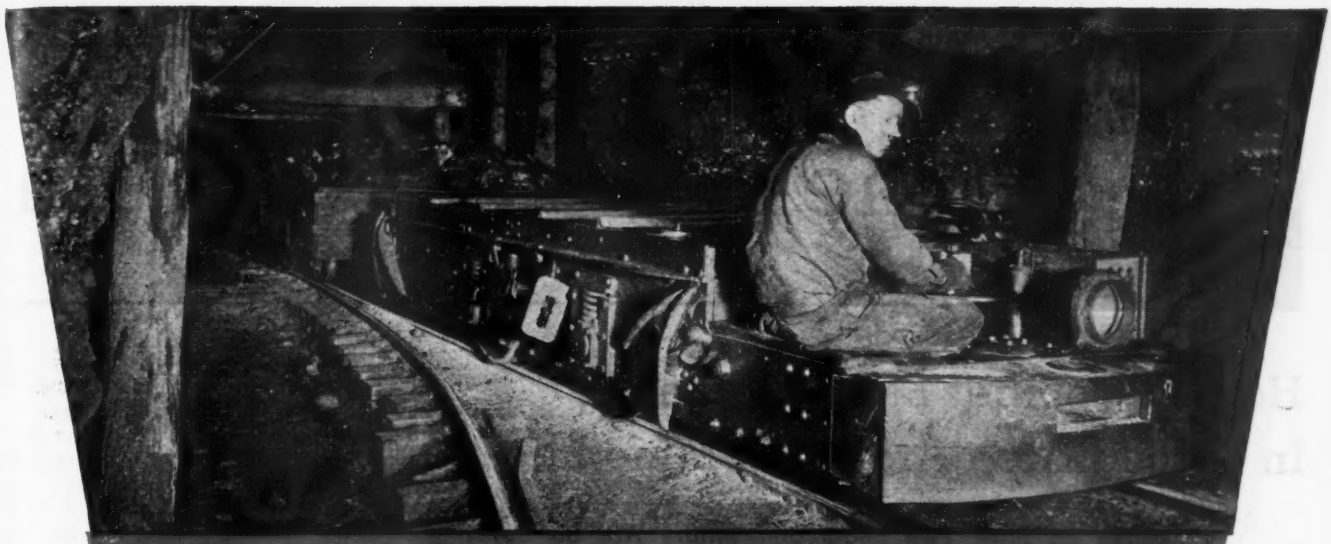
This record can be handled in one of three ways. If it is desired to limit the responsibility of the mine office, the record itself can be sent to the general office. Or, it can be copied and sent there, or if they do not want to copy every figure or have the files filled with a lot of unnecessary figures a transcript can be made showing only the account names and numbers and the amount, debit or credit, in the "Grand Total" column.

Cost reports and analytical data of any kind can be taken from this "Monthly Operating Report" by any typist. If a cost report is wanted for the mine, the data are copied from the mine section showing the costs by accounts and sub-accounts with the totals already calculated. Labor and supplies can be separated by the typist as she goes along by proper manipulation of the adding machine.

Similarly, reports of operation of stores, clubhouses, tenements and any other statistical data needed merely require typing. No further analysis of any kind is necessary, since it already has been done in the process of posting the operating reports. Costs then are truly byproducts of posting.

This system is based upon the operation as the unit. If the operation has one mine, the system works. If there are two mines, all that is necessary is to add additional sheets, etc.

One result is a material reduction in the work in the general office, because in actual practice only a few ledger accounts are necessary and the entries are posted directly to the ledger without further journalization or copying. The writer was auditor of one coal company and secretary of another, keeping the two sets of general books in one office. We had 38 accounts on each general ledger, and the taking of the trial balance was a matter of 5 to 10 minutes each month, consisting merely of listing 38 items in "plus" or "minus" position on the adding machine. After listing the figures from the last page, we pushed the total key and got "00." Our accounting troubles were over until the next month.



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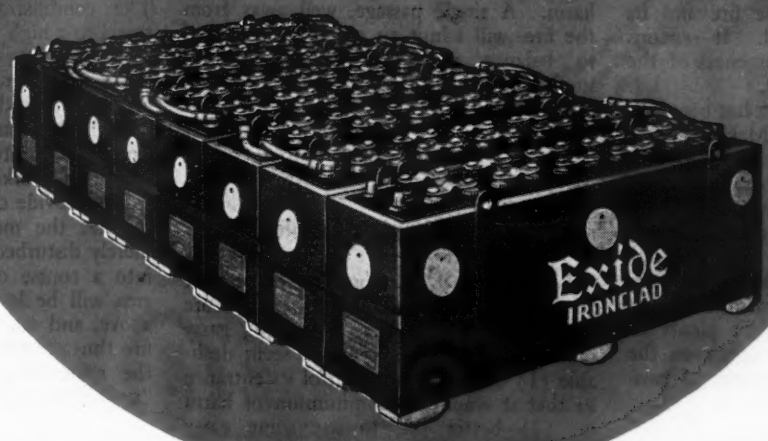

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The Foremen's Forum

How to Combat Stopping Leaks In Sealed Area Around a Mine Fire

Pressures on Mine Fire Seals and Pillars Are So Severe That Both Inevitably Leak Unless Pressure Behind Them Is Braced by Admitting a Gassy Medium Through a Suitable Port

IN TWO previous articles* have been set forth in detail respectively (1) three advantages of a large sealed fire area, all depending on the *chemistry* of its gases and (2) two advantages which were based on the *physics* of the fire; that is, on the contraction of the bases as the fire and its environing atmosphere cool. It remains to be explained how the largeness of the sealed area favors its *control*.

Though the mining public has been satisfied with the declaration "Make the seals tight," it is very clear that they cannot be made leak-free against the slowly but surely mounting differences of pressure that would be exerted if all of the stoppings, pillars, roofs and floors absolutely and entirely barred the passage of air. The long periods during which the sealed area, inclosure or enclave is cooling give the air plenty of time to wriggle its way through even the finest, longest and most tortuous of passages.

Can Pillars Stop Air?

Coal that can and does pass water through its crevices and interstices, making the mines wet, even before shooting and overstressing has weakened its structure, is expected by "wishful thinkers," even after its integrity has been destroyed by heavy shots and extensive mining, to resist the passage of air for days and weeks. They see water entering the mines from the surface and yet still believe that the pillars, roofs and floors of a much-mined area can be made airproof. No brattice or pillar will be leak-free. Therefore, some other form of control than the suppression of leakage is necessary and, with a large area, such a control can be established.

Restoring Inner Pressure

This can be done with a large sealed area (1) because, with such an area, the quantity of "gassy medium" or "gassy filler" (air or other gas mixture) needed to so restore the meager internal pressure that it can cope with the imperious external pressure will be greatly reduced as the temperature at sealing will be lowered and the heat drop will be lessened and (2) because it enables the leakage to be so relocated that, when it occurs, it will do no harm. A single passage, well away from the fire, will admit air or let it out, so as to balance pressures without reviving smoldering embers. When the air or other medium is allowed to enter at a point remote from the fire, fresh air will not enter near the fire unless a draft of air past the fire is established and maintained.

Two Ways Available

Seeing that it is impossible to prevent air from forcing itself into the inclosure unless some other pressure-restoring gassy medium is provided, it would seem desirable (1) to use air and control its entrance so that it would do a minimum of harm or, (2) better yet, to use some gassy medium that would be less costly or even wholly inexpensive, even if not entirely chemically inert. A large area seems to offer possibilities that either of these two solutions could be made to give satisfactory results.

It remains, therefore, to be proved that to the earlier advantages specified may be added these further advantages that:

(e) Largeness of area makes it possible to control the incoming pressure-restoring medium so (1) that it will all enter at a point or points remote from the area of disturbance around the fire; (2) that it will interpose itself *behind* the body of inert gas in the inclosure, pushing that gas forward as a shield between the air and the flame or hot embers and (3) that it will position itself as far as possible from the fire.

(f) Largeness of area makes it possible to use air or other pressure-restoring medium that otherwise would be undesirable.

In relation to control feature (1), every fire is a source of atmospheric disturbance (see Fig. 1), especially in a pitching seam. The combustion gases, being hot, rise, travel to a high point where they are slowly cooled and then some of them, displaced by more recently heated gases, and by gravity, descend and return to the fire to be reheated and recirculated. The fire usually is located where there are room-and-pillar workings with standing pillars which provide channels for the air and gas so that the medium in the area is not merely disturbed but directed more or less into a course or courses. The disturbed area will be located mostly in the region above, and on, a level with the fire. The fire thus creates in the sealed area what in the mine as a whole would be termed "natural ventilation."

Enter in Static Air

These currents are provocative of fire revival, if on their journey they can pick up air that has been pushed into the inclosure by the pressure that is greater without than within that sealed area. This pushed-in or so-called "inbreathed air" as it enters stands on the side lines waiting for just

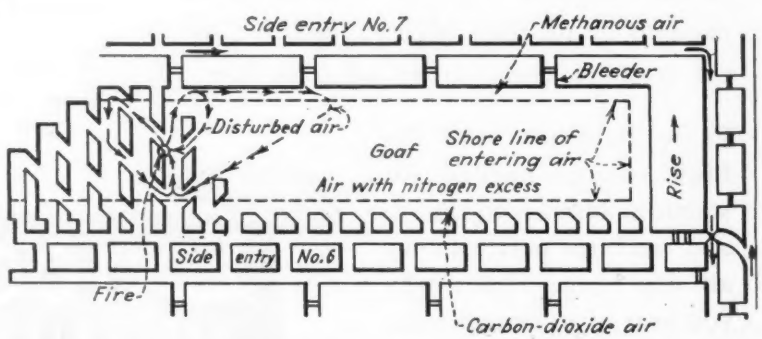
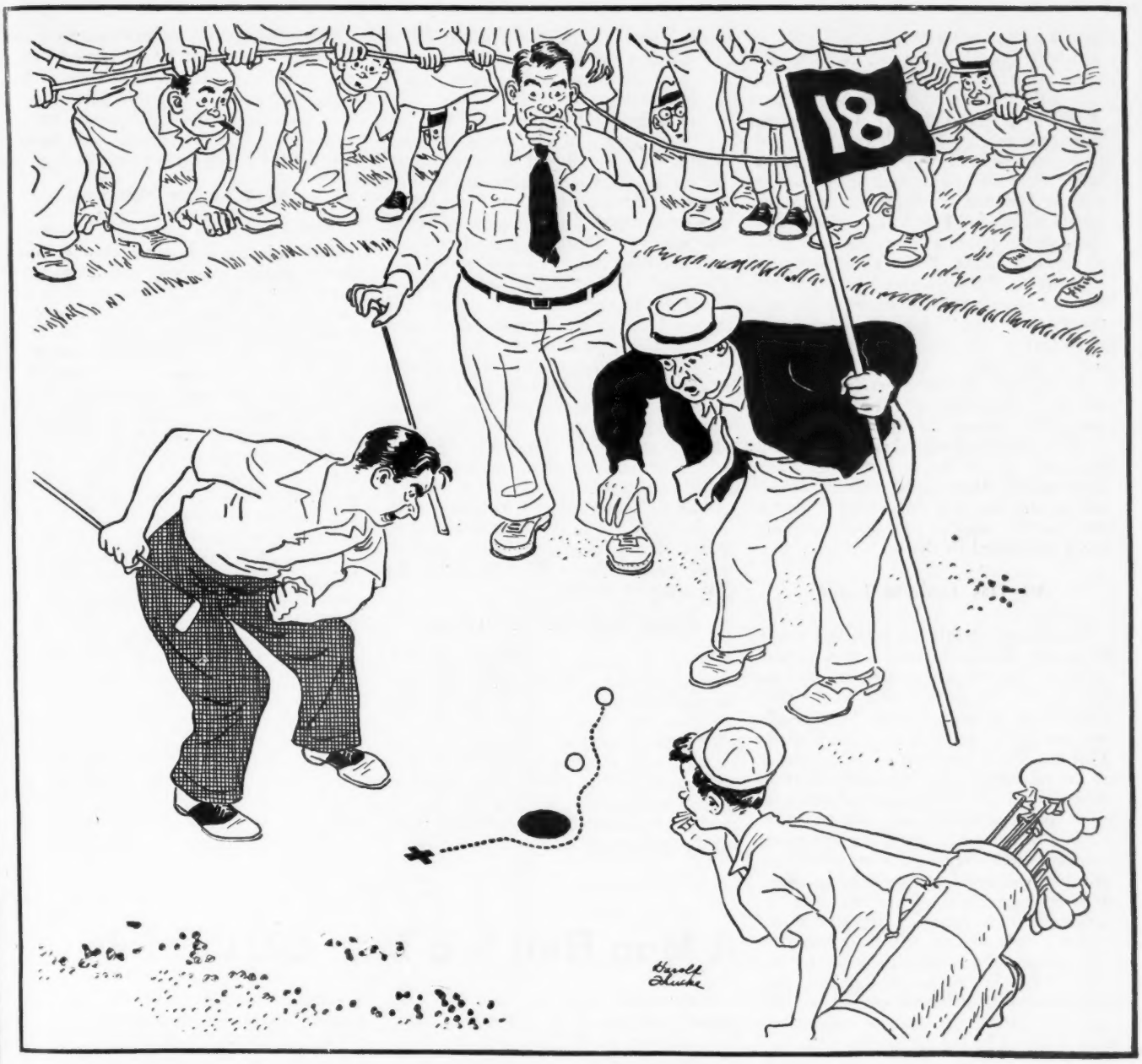


Fig. 1—Note the air circulating around the fire, impelled by its lightness after heating and by its coolness after it has lost heat to the pillars. In time, this movement decreases, for the fire gets cooler and the pillars get warmer.

* See February, 1945, *Coal Age*, p. 124; May, p. 114.



Nothing Rolls Like a Ball . . .

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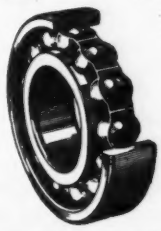

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such a partner to waltz it around the circle and bring it back to the fire, unless indeed it is in so small a quantity that it can stay within a crosscut or room neck where it will be protected from this air erosion. But some will go through ribs, roof and floor, and this air will arrive where the *mêlée* is at its height, and some possibly will be aspirated or drawn out from the room necks and crosscuts, though the speed of the currents may make this action negligible. Hence, if the air admitted in response to the unbalanced pressures enters the disturbed area, much of it will travel to the fire. This will be especially important if the air enters at the high side of the area.

If it enters, on the other hand, where the air is stagnant, it will stagnate also and remain around the point of entrance. With a small inclosure there is no purely static air. All of the air is moving. In a large enclave, there is a possibility of admitting air that will stay where it enters and merely equalize pressures without being introduced to the fire.

Air Has Definite Limit

Yet despite all that has been said about air passing through barriers, it is important to recall that there is a definite limit to the quantity of air that will try to pass the barriers unless a current in, through and out of the sealed area is established. That quantity is based on (1) the volume of the inclosure, (2) the change in temperature, and (3) the quantity of moisture made and condensed, and this quantity will not be exceeded even if the resistance of pillars and stoppings is reduced, nor will it be much reduced by making pillars and stoppings tighter. It has been seen in the immediately foregoing article that if, in a big inclosed area, the same *quantity of thermal units* is shut in as in an inclosure of only one-fourth the size, the inbreathing with the larger enclave will be only 15 percent per unit of volume of what it would be for the smaller area, also per unit of volume. If then the volume of the larger area is four times as great as the volume of the smaller, the quantity of air admitted would be $4 \times 15 = 60$ percent as much as with the smaller area.

However, not only will there be less air admitted but the effect also per cubic foot will be much less, because in the larger area the air admitted will be 2.70 percent of the entire volume and in the smaller area 18.19 percent. In the first case all the air might be so admitted that it would not approach the disturbed zone and in the other case it would be almost sure to invade that area, no matter what precautions were taken to avoid that misfortune.

Here should be injected a word of caution. The assumption on which these calculations were made was that no section of the goaf would fail to participate in the cooling effect and in the consequent shrinkage. But it is easy to see that in a very large area, when the fire cools, some parts will not cool at all, for they have never been heated and therefore the atmosphere in them will not contract and adding such areas on to the original area cannot increase or decrease the quantity of air pushed into the sealed area due to a fall in temperature and a consequent drop in internal pressure.

An important factor in preventing the air from getting to the fire is the nearness to the fire center of the air's entry to the sealed area. Given a large area with the unbalanced pressure within and without the area extending all over the immense periphery, more air will enter at a safe distance from the fire than with a small sealed area. The fixed limit to the possible admission of air is another important factor. In studies of mine-fire control, not enough stress has been laid on it. Tightness of stoppings and pillars has been stressed, whereas the main requisite are: (1) to have less air disposed to enter the inclosure; (2) to have the area so large that the proportion of air admitted to the whole volume of the atmosphere inclosed will be small; (3) to have that air enter where it can do no harm, and (4) to have it enter so slowly as not to cause currents and to permit the air in the tightened goaf to travel along with air traveling where the goaf is not so tight.

Speed, 0.01 In. per Minute

With an average temperature on sealing of 100 deg. F. over the entire area, with the area 300x1,000 ft. and the air traveling all over the cross-section of 300 ft. width, the average speed of travel of the air, if it took a month to lower the average temperature to 80 deg. F., would be almost exactly 0.01 in. per minute. It must be remembered, however, that there will be movements back and forth due to changes in surface pressures and there will be some section of route between tight and loose goaf, though not much at any such slow speed. Obviously, such a speed will not create any disturbance and at such a speed, goaf, unless very heavily weighted, will pass air readily.

Most Tightly Near Face

The air tends to enter the inclosure at points near the fire rather than at more distant points. At points near the fire, not much roof usually has fallen to block the air and the distance the air will have to travel to restore pressure will be at a minimum. These nearer points need stopping first so as to make the fire "inbreathe" its air from the more distant parts of the proposed inclosure. They also might well be more deliberately stopped than those at a distant point or, better yet, an opening at A, distant from the fire, may be provided with a small pipe to serve as a port for the admission of air. The air is not trying to get at the fire; it is merely being forced in toward the lesser pressure. When enough has entered to raise that pressure to the pressure ruling outside the sealed area, its mission to equalize pressures will have been performed.

In fact, as the air will come only a certain definite portion of the way and stop like an ocean *tide* at a definite "shore," dependent on the ratio between the two volumes at sealing and after cooling respectively, it will be well to admit the air at a more distant point or points of the inclosure, so as to be sure that, when it enters and makes that quite definite advance, it will not reach the vital area of disturbance.

A Man Hurt Is a Man Off the Job

With these days of drafts for war, present and past, it is well to remember that casualties of all kinds, whether on or off the job, deplete the working force, often of its most essential men. The draft boards may be induced to spare such key men, but casualties show no such discretional consideration. Little attention by industry is paid to off-the-job casualties. No one is "hauled over the coals" for them, so their frequency does not receive any attention, though they occur in great numbers just the same.

Discussing the experience of the Bethlehem Steel Co., P. C. Barthol, superintendent, safety and welfare, says in the *National Safety News*: "Over a period of 18 years, 312 of our employees died as a result of accidental injuries. Of these deaths, 133 occurred in the plant and 179, or 57½ percent, on the outside. The records also showed that, during the six-year period 1938-43, two and three-quarter times as many employees were hurt off the job; twice as many were killed and nearly twice as many days were lost.

"As far back as 1913, the general manager and the superintendent of safety and welfare helped to organize the Lehigh Valley Safety Council," and "in January, 1943, a man was hired by the company to serve as secretary-manager of the Lehigh Valley Safety Council and devote practically his entire time to the prevention of off-the-job accidents." All this is an area where the Bethlehem Steel Co. is not the sole industrial project. With coal mines, the coal company is even more completely the end-all and be-all of the community, and anything it does for safety should bring even greater benefits to the company in its train, if the service can be made as effective.

Community health is equally important, because the employee who is sick is sure to absent himself, and if his wife or child is sick, he is likely to be at least tardy in attendance, if not altogether absent. A tardy man, in most instances, does not report at the mine at all. Whether men are few or plentiful, absenteeism always is embarrassing. A mine without absenteeism would, in every run, have the needed man for every job, the needed miners to supply coal for every locomotive, full crews for every loading machine. An air of well-being would pervade the camp, and a lessened drain would be laid on the doctor and hospitalization funds. Some companies have installed a nursing service, but still more important is it to distribute good advice on the manner in which health can be maintained.

State-Board Questions

Fireboss, Indiana

Q.—What is an overcast?

A.—An overcast is an "air bridge" with supports and ramped approaches at either end. It carries the air from one mine heading up and over another mine heading, usually lying at right angles to it, so that the air going over the bridge cannot join the air current in the heading thus crossed.

Thus, if the overcast serves a side heading, it compels the air when it leaves that heading to go direct to the return of the main heading, taking with it all the impurities it has picked up on its way. If, on the other hand, overcasts serve the air of the return heading of the main entry, they make that air pass over the roadways of the several side entries, so that the return of the main entry will not mingle with the fresh air going into those side entries.

A Costly, Ineffective Way

A clearer understanding of the overcast can be furnished by stating that in earlier years the usual method of ventilating a side heading was by erecting a door in the main heading between the intake and return of the side heading, so as to cut off, or at least baffle, the air current in the main heading and thus force the air to detour into the side heading. That air, after passing to the end of the side heading, would be returned by a parallel heading to the point on the other side of the door, where it would turn and travel up the main heading to the next side heading. There a door similarly located would divert the current and make the air travel into that entry also.

That was the old way, suited only to small mines, very costly, very inefficient and always ineffective. The present way is to use overcasts. The air is "split," or divided, at the mouth of the side heading into two parts, part going straight ahead and part being diverted to the side entry. The air thus split off the main current travels to the end of the side heading and returns to the main heading, as it did when a door was used, but at the main heading it passes over the bridge of the overcast and so reaches a crosscut, through which it passes to the return of the main heading.

Thus, enough air is diverted to satisfy the needs of the side heading without having to carry the rest of the air into that side entry and back again and without having to make it travel not only into this one side entry but, as often happened, into every side entry in every part of the mine. The newer system, in which overcasts are used, saves power in the ventilation of the mine, because the air does not travel so far and so is not exposed to as much resistance as before. Each split of air travels only the length of a single side heading and then doubles on itself again.

Q.—How do overcasts aid haulage?

A.—By eliminating doors. With an overcast, trips can go ahead without waiting for doors to be opened. If a trapper is not employed, the delay is considerable, for the door also has to be closed. In addition, more power is needed, because trips have to be started and stopped. Accidents occur also when trip riders run ahead to open doors or when they run to catch a trip after closing the door behind them.

Mine Foremen, West Virginia

Q.—List some unsafe haulage practices.

A.—This question apparently does not refer to track or heading construction but to misuse of provided facilities, nor does it refer to face placement of cars.

(1) *Making Flying Switches*—This operation consists of pushing cars at a high speed over a switch and throwing the switch between two units in the trip, so that some or all of the cars travel along one track and the locomotive or certain other cars travel on the other track. This practice is dangerous: (a) Because the switch has to be thrown in an extremely short time and may not be thrown with sufficient speed to make the realignment of the rails perfect before the car wheels that have to be diverted arrive at the switch points. If the switch is not completely thrown when the wheels to be switched arrive, the cars will be derailed. (b) Because this speed in throwing the switch may injure the thrower. (c) Because the cars are pushed, not pulled, and therefore are likely to leave the track. (d) Because some of the cars have to travel a curve when being pushed and accordingly are the more likely to be derailed. (e) Because the motorman, in pushing his trip, if it is a loaded trip, will have high loads in front of him and cannot see where he is going. See comment on trip pushing which follows, Section 2.

Pulls In, Pushes Off

(2) *Pushing Trips*—This is a practice which should be avoided as far as possible; because a pushed trip is likely to bind on the track, especially if it is an empty trip and is traveling on a curved track or at switches. If a wheel of a pushed car ceases to be held in place by the rail on which it is running and leaves the track, the pushing of the car will force the wheel farther off the rail and result in a complete derailment, whereas if the car is pulled, the more it is pulled, the more nearly will the wheel and the car be dragged back into line. Pulling favors rerailing; pushing causes derailing.

So much for the preliminary derailment; what follows is (1) with car pushing, a buckling of the trip into the rib, and (2) with car pulling, usually merely a bumping of the wheels over the ties without any real damage and with only a few cars derailed. Especially is car pushing dangerous where the track is not clean but is covered with coal which has fallen from the cars.

Running Blind

As already stated, pushed trips are dangerous, because the cars, when heavily topped, decrease visibility, and the motorman accordingly may run his trip into a standing trip, into incompletely cleared cars or trips, into cars running wild, into fallen rock or into ill-placed piles of posts, rails or pipe, or even into men, and may not see tail lights, reflector buttons or other signals as soon as he should.

The practice of pushing trips also endangers men traveling along the heading, especially if the outside of the curve is on the so-called "safety side," along which such pedestrians are accustomed to travel. It also jeopardizes the motorman and the trip runner. It may cause only a derailment, but the derailment that follows may result in a hernia or a sacro-iliac strain, when men overstress their muscles in their efforts to put the cars back on the track.

And again the derailment may bring down posts, crossbars, lagging and rock, with the result that men are killed by the falls thus occasioned or by an ignition of the coal dust thus thrown into the air.

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With a little contriving, pushed trips usually can be replaced by pulled trips, with great increase in safety.

(3) *Riding Pushed Trips*—Empty cars are so light that they are quite likely to be derailed and the men spilled out.

Sprinter Sprawls

(4) *Running Ahead of a Trip to Throw Switches or Open Doors* is a likely source of accident. The only good sprinting track is along the center of the roadway. Almost fortunately, it sometimes is not so good, and then there is less risk that such sprinting will be attempted. The motorman perhaps has a heavy trip, and the track center is such as to invite sprinting; accordingly the triprider takes a chance and falls in front of the locomotive. He may trip at a switch, a frog, a guard, or other rail and, if the three former are not blocked, his foot may be held by one or other of them as in a vise.

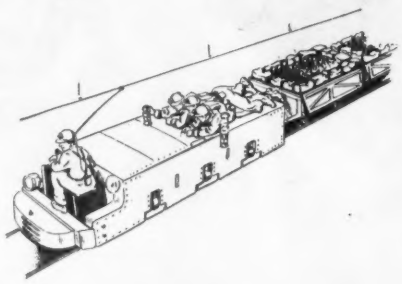
Outrunning the trips to throw a switch or open a door.

In consequence, it will be his last day's work, for, with the locomotive loaded nearly to capacity, it is not easy, or indeed possible, to stop promptly if an accident looms. Young men like to demonstrate their agility and their power to do the "impossible," but such sprinting should be strictly forbidden.

Saving a single fatal accident would well pay for the services of a trapper or switch thrower, still more for the cost of purchase and installation of an automatic door. Avoidance of a single fatal accident would compensate also for the time and tonnage lost by having the heavy trip stop and start when the switch is to be thrown or the door opened or closed. Too often the trip is so heavy that both motorman and manager want the triprider to throw the switch without any delay to the locomotive, for if stopped the locomotive may not be able to start, because of an adverse gradient or an excessive draft of power on an electric cable already overloaded.

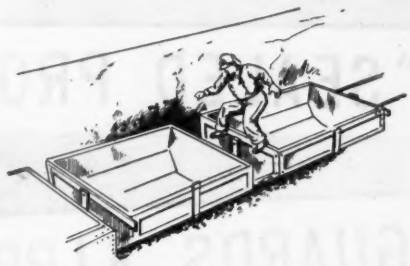
Stealing a Ride

(5) *Riding on a Locomotive*—The locomotive is not always provided with hand holds and those provided do not always furnish adequate protection; accordingly it is perilous to ride on its smooth surface, especially when it is rounding corners or negotiating a bad track joint. With a pushed trip, riders on the locomotive also obstruct the view of the motorman, who might otherwise see a stalled trip ahead or a fall of rock on the track and take action accordingly. When only one man rides on the locomotive covers, he has a better opportunity to brace himself, but if one man other than the triprider "steals a ride," it is difficult to find a reason for excluding anyone, and several men will avail themselves of the opportunity and assume the risk, crowding and thus endangering the triprider, who must always ride on one of the two perilous outside positions, for he has to be where he easily can get on and off to perform his duties. As he is obliged to find a place on the trip and as he usually has the experience that will enable him to ride on the locomotive with a degree of safety, he only should be allowed to travel on the locomotive covers. Of course, trip riding is forbidden to all but the regular triprider and the motorman, the latter having a seat in the cab, but the practice of promiscuous riding still persists nevertheless.



Lying like cordwood on the slippery covers of a mine locomotive.

(6) *Climbing or Jumping From Car to Car While Trip Is in Motion*—Contact with the roof may injure head and spine; contact with the trolley wire may cause an electrocution.



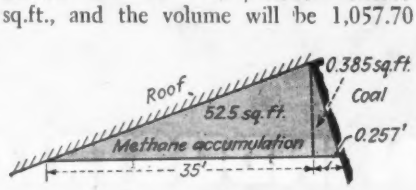
Jumping from car to car to reach front car of speeding trip.

(7) *Riding Between Cars*—This act may be a man's last, should there be a derailment. Men thus riding frequently fall between cars and are killed, because of their inadequate foothold on the narrow car bumpers. Moreover, one bumper may ride another and the doors of the cars may swing and dislodge the riders, who also may sit on the car end and collide with the roof or may crouch and so fall or overbalance. Tripriders should get inside the car, if empty, when the trip is not moving and remain in the car until the trip stops.

Mine Manager, First Class, Illinois

Q.—If you found the methane at the working face extended down 3 ft. from the roof and tapered out 35 ft. from that face, how many cubic feet are there in the room if it is 20 ft. wide?

A.—Roughly the cross-section of the methane accumulation along a line at right angles to the face will be one-half 3×35 ft. $= 0.5\ (105) = 52.5$ sq.ft. As the distance from rib to rib is 20 ft., the volume of methane will be $52.5 \times 20 = 1{,}050$ cu.ft. This assumes that methane accumulation rests perfectly level on the air below it. Strictly speaking, as the roof rises 3 ft. in 35 and as the coal face is supposed to be at right angles to it, the coal will pitch forward (see illustration) 3 ft. in 35 ft. or 0.08571 ft. per foot. As the depth of the methane is 3 ft. at the face, the coal will pitch fordward 3×0.08571 in that distance $= 0.25713$; say 0.257 ft. The triangle thus formed will comprise $0.257 \times 3 \div 2 = 0.385$ sq.ft. So the total cross-section will be $52.5 + 0.385 = 52.885$ sq.ft., and the volume will be 1,057.70 cu.ft., so as measurements of methane always are inexact, the previous answer, 1050 cu.ft., would be accurate enough. In the illustration the pitch of the room is much exaggerated and in making the calculations it is assumed that the measurements of the depth and length of the methane accumulation is taken as an engineer might measure them on the vertical and on the horizontal projection respectively.



Q.—How many cubic feet are there in an entry 5 ft. high, 12 ft. wide and 2,000 ft. long?

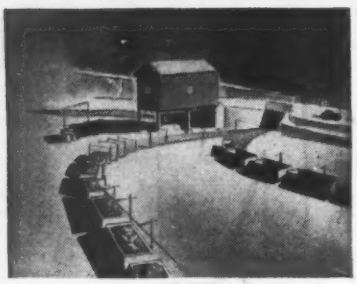
A.—$5 \times 12 \times 2{,}000 = 120{,}000$ cu.ft.

Q.—How many square feet of rubbing surface in the above heading?

A.—$(5 \times 2 + 12 \times 2)\,2{,}000$
$= 34 \times 2{,}000$
$= 68{,}000$ sq.ft.

Q.—It was found that in an airway 6 ft. high and 10 ft. wide smoke was traveling at a speed of 336 ft. per minute; what quantity of air was passing in that airway per minute?

A.—Cross-section—6×10 ft.$=60$ cu.ft.
Quantity of air passing per minute = Cross-sectional area × Travel per minute
$=60 \times 336 = 20{,}160$ cu.ft. per minute.



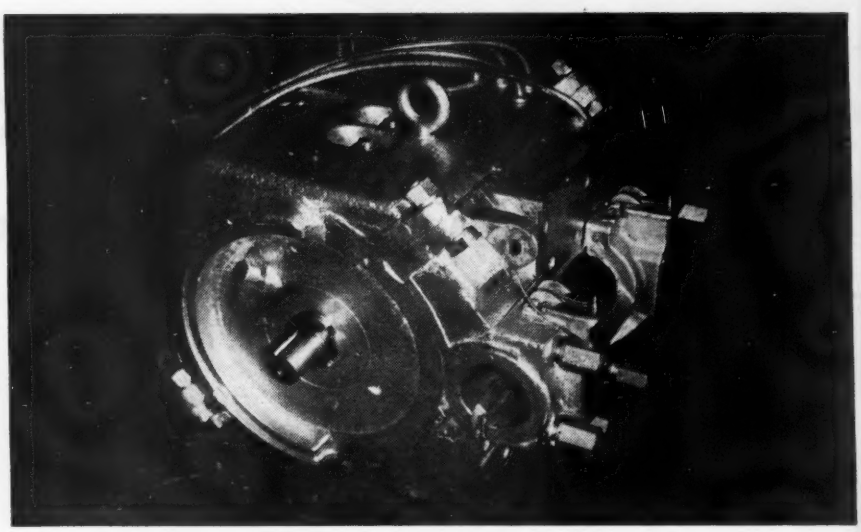
Operating Ideas

Paint Aids Motor Installation

GIVING THE MOTOR a coat of aluminum paint before it leaves the repair center helps the mechanics at the colliery do a better installation job, says Johnstone Campbell, superintendent of the Drifton shop of The Lehigh Valley Coal Co., Drifton, Pa.

"In overhauling a motor, such as shown in the accompanying illustration, all worn parts are arc welded with steel so hard that it is not easy to machine. Tough steel bolts are installed and where required the bolt heads are made longer than standard to help the mechanics in the installation. The motors are machined to close tolerances. The electric parts are thoroughly inspected and repaired. When completed, we believe we have a motor that is an improvement over the original.

"Then, to help the mechanics do the assembling, we spray the motors with a coat of aluminum paint which improves the visibility in the pits where the mine mechanics are working."

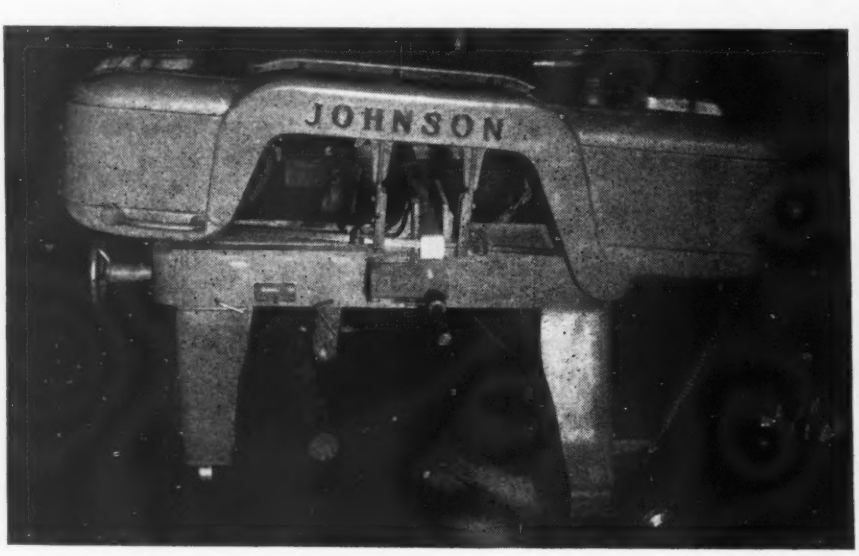


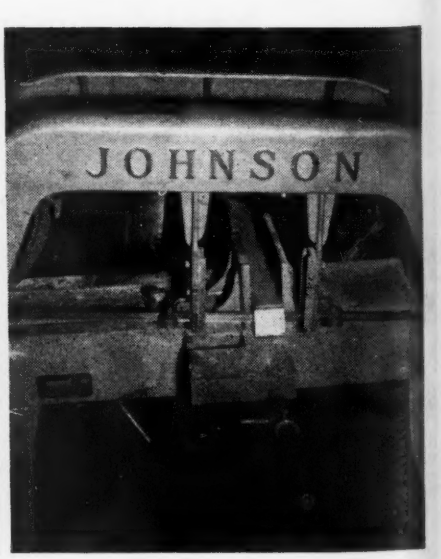
Every motor is given a coat of paint before it is returned to the colliery.

Portable Metal Saw Roams Machine Shop

A METAL-CUTTING band saw speeds up shop work and requires little attention, says William Rohland, machine-shop foreman, Jeddo shop, Jeddo-Highland Coal Co., Jeddo, Pa.

The Johnson portable metal-cutting band saw, shown in the accompanying illustrations, is used wherever most needed in the machine shop. The machine will accommodate work up to 10 in. in diameter and can even be moved to cut something that may be hanging from the shop crane. Equipped with a hydraulic feed and four cutting speeds, the saw may be used on any metal from aluminum to steel.





Left: Continuous cutting operation saves mechanic's time. Right: Portable saw used about the entire shop.

Pumping Overburden with HYDROSEAL PUMPS

Hydraulicking and pumping of overburden with Hydroseal Pumps in many instances costs less than other methods and, in addition, the spoil can be deposited so that it will never have to be moved again. The discharge line of Hydroseal can run anywhere, across creeks, ravines, roads and even over a mountain. Water used in pumping can be recirculated, if desired. . . . Photographs show a 14 inch Hydroseal Pump used by a coal mine for pumping spoil. Photo A shows the high pressure nozzle which washes down the overburden. It flows thru ditches to a sump, Photo B, where the suction of the Hydroseal Pump picks it up and transports it to point of disposal, Photo C. On this job the overburden consisted of clay, quicksand, sand, gravel and some small boulders up to 8 or 10 inches in diameter, all of which were handled by the Hydroseal. This is only one of many coal mine jobs for Hydroseal Pumps. Others include, (1) pumping of sand or sludge in coal washers, (2) pumping tipple or breaker refuse or silt to storage piles, to distant locations for storage or from mine to preparation plant, (4) reclaiming culm banks, (5) cleaning muck from reservoirs, underground sumps, shaft bottom sumps and air shafts. Send for our 32-page Catalog No. 140 which explains how the Hydroseal Principle and Maximix Rubber Parts reduce maintenance to a fraction of what you are accustomed to expect on abrasive material pumping jobs.

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WRITE FOR CATALOG TODAY

Pit Cover Conveniently Moved Off in One Piece

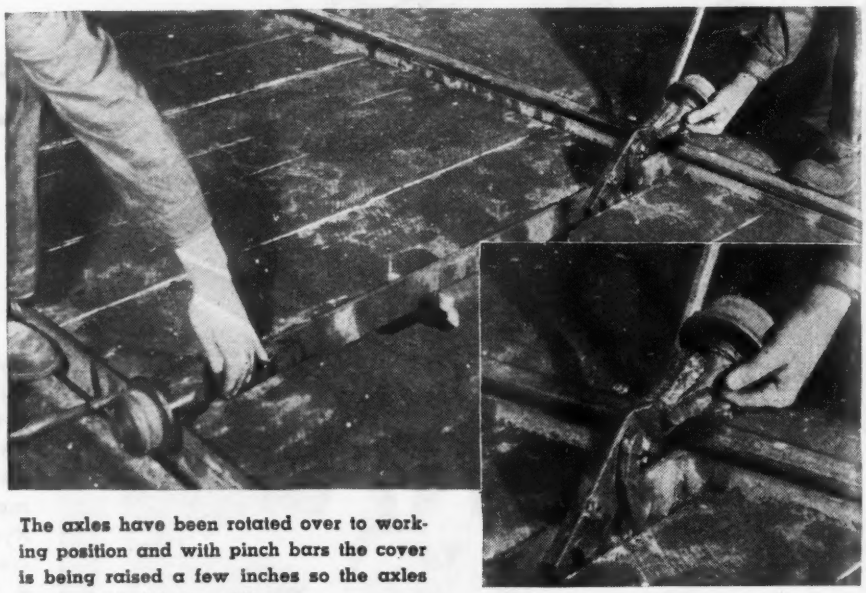
SAFETY, convenience, and ease of removal are the advantages of a new method of guarding the shop repair pit when not in use at the Arista (W. Va.) operation of the Weyanoke Coal & Coke Co. Objections such as those against a removable post and chain railing formerly used are no longer valid. That earlier method blocked from use a considerable floor space, caused men to have to walk farther—that is, around the pit when crossing from one side of the shop room to the other—and required handling the posts and chains and storing them when the pit was in use. The new guard consists of a platform cover that allows use of the floor space occupied by the pit, yet is moved in one piece without manual lifting and without the use of an overhead crane.

The cover, 21 ft. long, is removed from above the pit by pulling it along the track. During that operation its weight is carried by four small wheels that travel on the tops of the rails. Normally these wheels and their stub axles are folded back into recesses where they are practically flush with the top of the cover.

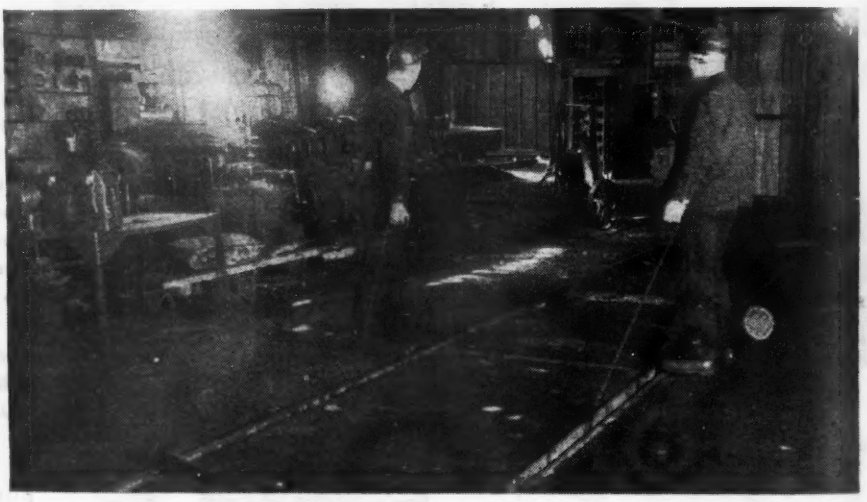
This cover consists of cross planks 1½ in. thick bolted to 3x3x⅜-in. angles which rest on top of the rail bases. The series of illustrations includes the steps necessary to remove the cover from the pit.

Two men usually do the job and it requires only about 1½ minutes, including their stepping over to the wall and getting two small pinch bars. After an axle is rotated over so its wheel rests on the rail, the point of the pinch bar is inserted in a hole in the angle-iron side frame. Then while the cover is pried up a hook mounted on the axle is clipped over a stud. This holds the axle in place, making the wheel carry the weight of the cover.

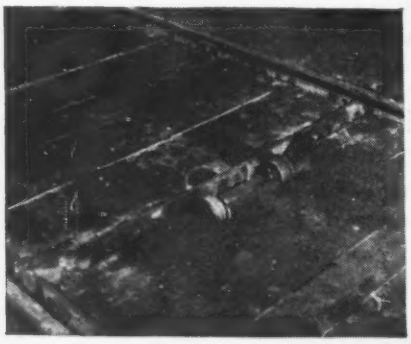
To slide the cover off the pit two men use pulling handles that are hinged to the cover. These are made of ⅜-in. rod and arranged so that they fold down flat when not in use. When the cover is back over a part of the track having no pit it can be let down so its top is flush with the tops of the rails and the wheels can be folded back, if desired. R. W. Evans and J. R. Stover, shop mechanics, designed and built the new pit cover. They are the men demonstrating its use in the illustrations.



The axles have been rotated over to working position and with pinch bars the cover is being raised a few inches so the axles can be locked into position.

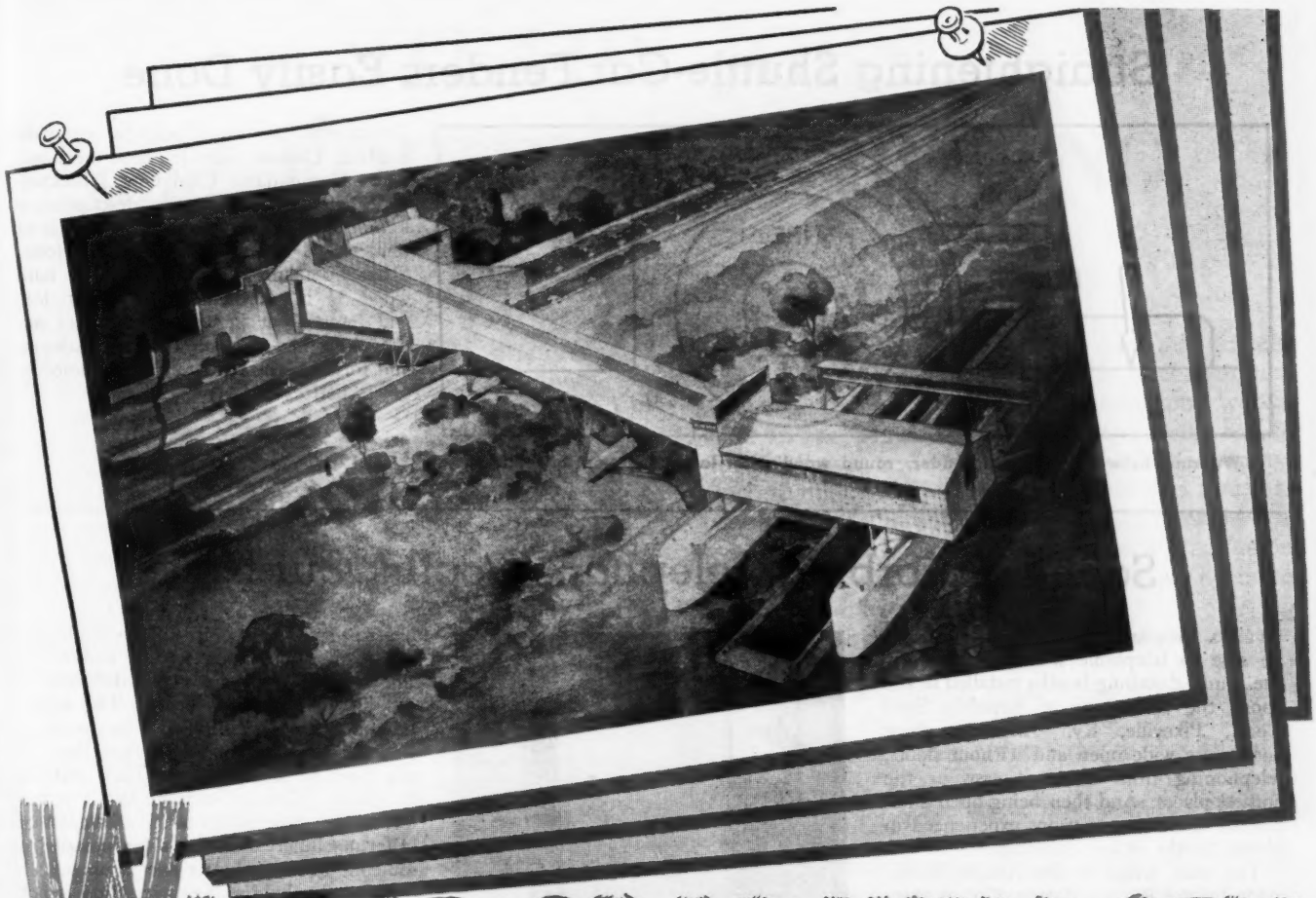


Using the handles to pull the cover from the pit and move it to another section of the shop track.



Pit is covered by a platform whose top is flush with the tops of the rails. Supporting side frames rest on the bases of the rails.

Pit opened and its cover out of the way between rails in the background.



WHOSE COAL WILL SELL

when Supply *Exceeds* Demand?

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They are preparing by equipping for *better coal preparation*. Because, when buyers can CHOOSE—*clean* coals, of low impurity content, correct sizing, and uniformity—win the better markets and—the higher prices.

Morrow Tipples *provide* better preparation, improve quality, raise product value, cut operating costs. Morrow *streamlines production* from the mine, through modern, efficient preparation equipment, to cars and barges, in shorter time, at lower costs—in the best condition to SELL!

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=*INCREASED SALES!*

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2. correct sizing
3. high uniformity

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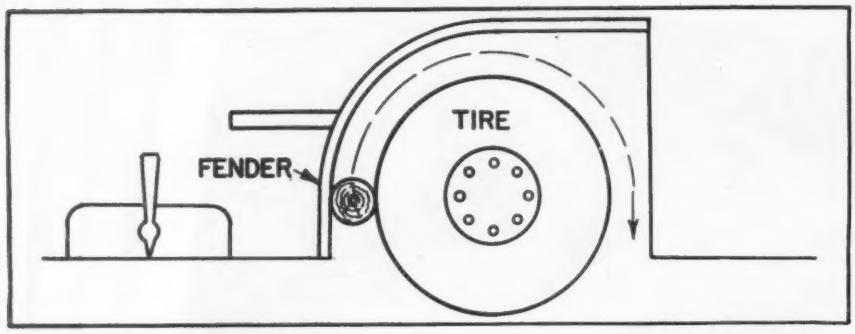
PERFORATED METAL SCREENS • STEEL STRUCTURES

Straightening Shuttle-Car Fenders Easily Done



Working between tire and fender, round wood roller takes dents out of fenders.

DESCRIBING IT as a practical every-day method, Thomas Jones Jr., head mechanic, Knox Consolidated Coal Corp., Bicknell, Ind., submits the following description of a method of rolling out bent shuttle-car fenders. "I have found," says Mr. Jones, "that by taking a round piece of hardwood 3½ in. in diameter and 3 ft. long and inserting it between the fender and the tire, then moving the car backward and forward, the fenders can be smoothed out to perfection."

Sound-Absorbing Telephone Booths Cut Noise

EVEN A VICTIM of claustrophobia should be able to telephone with comfort from the sound-absorbing booths installed in and about the new mine of Republic Steel Corp., Pikeville, Ky. Although these booths are wide open and without doors, telephoning from them is easy in the noisiest places. And their being open eliminates the sweating sessions experienced in phone booths in hot buildings.

The unit, which is the Acousti-Booth, made by the Burgess Battery Co., is shipped in a compact crate containing four flat pieces. The booth is assembled by driving a few screws. The walls, about 2 in. thick, are of sound-absorbing materials bound between plywood sheets punched full of small holes.

One booth is installed in the tipple, another in the headhouse and two underground at points where cross belts discharge to the main belt. In the tipple, the operation of vibrating screens makes it a noisy place but there is no difficulty in talking from the open booth. The underground booths are installed close to where the belt operators stand so that they do not have to step far from their stations to phone. Without such booths it is not unusual in some mines to see conveyors or other machinery shut down temporarily so someone can hear better over a phone.

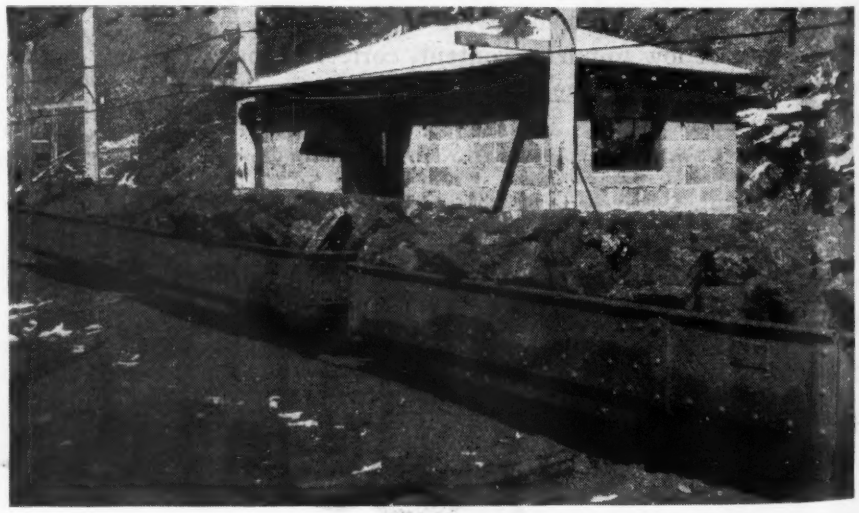
George Eagle, cleaning-plant supervisor, using the new booth in the tipple.

Privacy in holding a conversation is not materially affected by the lack of a door on the booth. One would have to be in the booth with the person telephoning to understand what he said into the transmitter in talking in an ordinary tone.

New Cars Among Haulage Improvements at Arista

OFFICIALS of the Weyanoke Coal & Coke Co., Arista, W. Va., give large credit to improvements in haulage for the increased output of 1944 which earned for the mine the Coal Age "War Production Efficiency" and "Victory Coal Production" awards. Scheduling of trips was inaugurated, trackage was improved by better drainage, a bypass was installed on the main line and the d.c. voltage improved by adding a 150-kw. substation unit. Fifty new steel cars carrying 4½ tons (hand loaded) and replacing some of the old 2-ton wooden cars, contributed some toward the increase although received late in the year.

The illustrations show these new cars in action on the main haul approach to the tipple. Specifications of these cars, made by the American Car & Foundry Co., include the following: lift endgate type; water-level capacity, 107 cu.ft.; height above rail, 26 in.; stub axles, 14-in. wheels, Timken bearings, gage, 56½ in.; length over all, 12 ft. 8 in.; width over all, 6 ft. 7 in.; and wheelbase, 40 in. The trip pictured is being pulled by a Jeffrey 10-ton locomotive.



The new cars, 107 cu.ft. and 26 in. high, are hand loaded to 4½ tons.

STEADY JOBS *and* EQUIPMENT BUYING

SUSTAINED employment is not an attainable goal unless we can moderate the erratic fluctuations which have characterized the markets for producers' equipment in past periods.

In the 35th editorial of this series, "Sustained Construction Activity", it was pointed out that there is no specific that can cure our economy of its "boom-or-bust" proclivities. Rejecting the notion that the construction industry could be so managed as to stabilize business as a whole, that editorial stressed the important contribution it could make to that end, and suggested several practical expedients through which construction activity might be regularized.

Producers' equipment represents an area of production quite as broad and diverse as construction, though smaller in aggregate value. The classification embraces all types of durable equipment bought and used for profit—locomotives, motor trucks, electric generators, conveyors, machine tools, farm implements, and so on down to surgical instruments and dentists' drills.

Although the output of such equipment averages over a long period only 5 or 6 per cent of the nation's total output, it resembles construction in its extraordinary ups and downs. While its component items differ widely in the amplitude and violence of their fluctuations, the class as a whole is one of the most unstable sectors of the economy, making therefore a quite disproportionate contribution to the cyclical swings of total production and employment. From 1929 to 1932, for example, the decline in the output of producers' equipment (at constant prices) was 65-70 per cent, in contrast to a decline of 25-30 per cent in the national output exclusive of such equipment and construction.

A more recent example of the volatility of demand in this field may be found in the movement of a monthly index of orders for industrial equipment, which rose from 92 in the spring of 1936 to 160 in the spring of 1937, falling thence to 65 in the summer of 1938 and rising again to 142 in the fall of 1939. Such fantastic oscillations present an obvious and inescapable challenge to all concerned with economic stabilization.

Not only are these fluctuations bad for the economy; they represent demonstrably bad buying policy on the part of the purchasers of equipment. Peaks in demand come characteristically just before a business depression (1919, 1929, and 1937, for example) when machinery costs the most to buy and install and when it has the lowest expectancy of continuous use. At exactly the wrong moment everyone wants to buy. In the depression itself, on the other hand, with costs down, and with nowhere for the economy to go but up, equipment is a drug on the market. No one wants it when it is cheap and has the greatest prospect for steady employment. Here is a behavior pattern so profoundly irrational there must be hope for its correction.

There is an inveterate tendency for business management to forecast the future simply by projecting the trends of immediate past. Although it is axiomatic that the chance for an extended period of further prosperity is inversely related to the duration of the prosperity already experienced, this truism is generally ignored. The longer the boom has run, the more certain is business management that it will continue indefinitely. Convinced at last by "actual experience" that prosperity is here to stay, executives give the green light to commitments for expansion and modernization previously deferred in a skeptical attitude of "wait and see". The result, so often repeated in our economic history, is an explosive burst of demand for equipment coincident with, and contributing to, the final spasm of a boom. Witness the phenomenal rise in industrial equipment orders during 1928 and the spring of 1929.

The same prophetic illusion works in reverse during a depression. Recent experience is projected into the future. Although the mathematical probability of an imminent and prolonged period of prosperity increases directly with the duration of a depression, it finds little reflection in business decisions. Timidity and caution are the order of the day.

Compounding the errors caused by faulty perspective, are a number of influences which make it extremely difficult for individual enterprises to follow a policy geared to sensible long-term considerations. In a boom, particularly in its climactic phase, most producers find their order books crowded beyond the potential of their current capacities and are faced with the alternatives of expanding or losing trade to competitors. In depression the situation is reversed, and producers with unused facilities find it difficult to justify increases in their capital charges.

An even more controlling factor in many cases is the availability of funds. This is especially important

for small concerns. Typically such firms enjoy but limited credit, and with no ready access to the securities markets, their capital expenditures depend primarily on earnings. When they are making money, they can afford to buy equipment; when they are losing, they largely disappear from the equipment market. Even great enterprises, though less dependent on earnings as a source of capital financing, are profoundly influenced by the volume of internal funds available for the purpose, a volume as a rule far greater in prosperity than in depression. Moreover, it is usually easier in good times to obtain outside funds through the sale of stock or by borrowing, since in bad times bankers, underwriters, and investors are susceptible to the same timidity and caution that afflict business management generally.

We are dealing here with a combination of psychological, physical, and financial forces which conspire to aggravate the instability of demand for capital equipment. What can be done to reduce this instability and thus to bring equipment purchasing into a more sensible and constructive pattern?

There is no panacea, no royal road to the solution. The problem has been with us since the beginning of the industrial economy. It is complex and difficult. It is not, however, wholly intractable. We may reasonably hope that industry will, through intelligent effort, make substantial progress toward a satisfactory solution. The industrial equipment field is one in which government, except for war periods, has exerted little direct control. The best insurance against the institution of government measures is to so conduct activities in the equipment field that no justification for government interposition can be made.

☆ ☆ ☆

1. The first and most important step is for industry itself to reconsider its heretofore haphazard and opportunistic policy in the purchase of equipment, substituting so far as possible a regularized, long-range programming of expenditure that will resist both the excited long-buying of booms and the equally disturbing underbuying of depressions. Such long-range programming is particularly appropriate and advantageous for large enterprises in established industries such as railroads, electric power, steel, automobiles, and the like, but it makes sense much more generally.

Once executives come to realize that a reasonably stable equipment program contributes not only to the welfare of the economy but also to the lowering of their long-run equipment costs, the opportunity to combine a public service with private advantage should induce them to recast their policies accordingly.

There is an even more compelling reason for purchasers of industrial equipment to do everything possible to regularize their demands. Some concerns unquestionably will find themselves in a postwar position where speedy delivery of needed equipment, even though it involves the payment of premium prices, will seem to be justified. But there is no system of accounting that can show it to be a profitable transaction to promote an equipment industry boom that runs a brief course only to collapse when the backlog of deferred maintenance and development has been satisfied. That, historically, has been the trigger which trips the door to the depression phase of the business cycle. No immediate advantage can compensate for the contagious paralysis that infects all business enterprise when major layoffs occur in any major segment. No precautionary measures, self-imposed by business, can be regarded as unduly severe if they can prevent this devastating blight.

2. Financial agencies can and should play a responsible role in regularizing equipment demand. Funds for the purchase of producers' equipment should be offered boldly and at low interest during depression periods, and should progressively tighten as a boom market bids up the price of purchase and installation. Banks and financial houses have excellent facilities for gathering and interpreting market and general economic information. It is good business for them, and for the national economy, to exercise their accepted discretions in a manner that will help to promote economic stability.

3. There now is almost universal recognition of the need for a thorough-going revision of our corporate tax structure to the end that effective incentives may be offered for private capital investment. The possibility of including provisions which would offer special tax concessions to equipment investments made in depression periods is worthy of intensive exploration.

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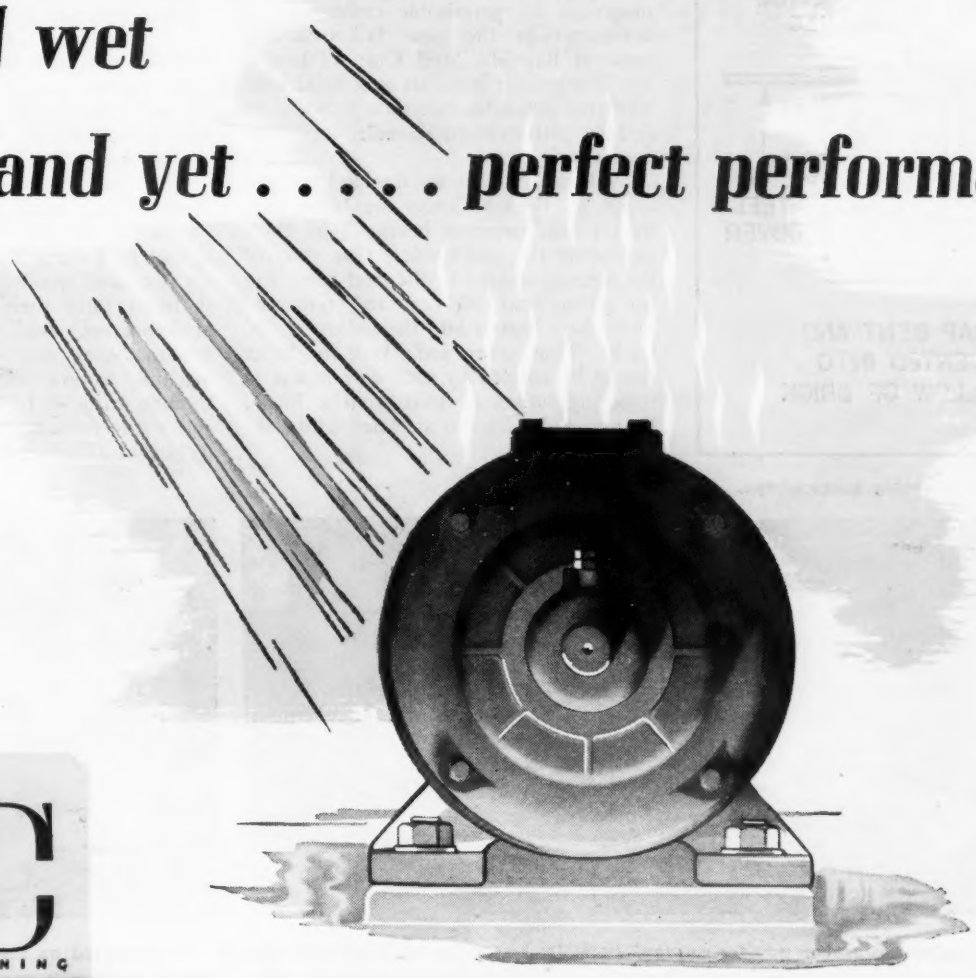
The fundamental problem here is educational. If all business enterprises in a position to do so were to regularize their equipment expenditures, it would have a tremendously beneficial effect. True, it would accomplish no miracles. For many concerns it is not feasible to schedule equipment buying over a long period. Even those who do schedule it are likely in practice to attain only a relative stability. It must be acknowledged, moreover, that few programs could withstand indefinitely a very deep and prolonged depression such as we had in the thirties. Nevertheless the adoption of stabilization policies where feasible would make a signal contribution both to the restraint of booms and to the mitigation of depressions. Here is something industry can do for itself.

It is easy to disparage such remedies for economic instability as are here proposed on the ground that they are partial only. However, joined with others also partial, they can achieve in combination a solid progress toward the goal of sustained high level employment—progress that is unattainable through economic cure-alls. The road suggested is a slow road, and difficult, but it leads upward.

President, McGraw-Hill Publishing Co., Inc.

Sweated and wet

and yet . . . . . perfect performance



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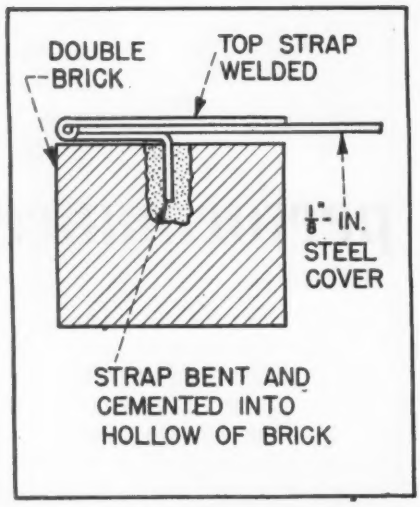
FIRST IN SILICONES

Portable Powder Boxes Made With Brick Walls



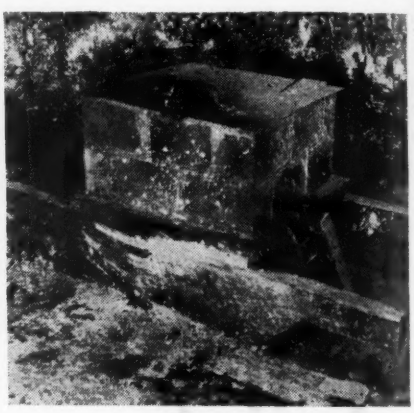
Method of fastening hinge straps.

BRICK BOXES have been used with entire satisfaction for more than a year as portable magazines for permissible explosives and detonators in the new full-mechanical mine of Republic Steel Corp., Pikeville, Ky. The powder boxes are on wooden sleds while the detonator boxes are mounted on sled-like platforms with handles for a two-man carry.

Walls and bottom are double brick and are 4 in. thick. Covers are ⅛-in. steel with rubber conveyor belting ½ in. thick riveted on the under side. One strap of the hinge is welded to the steel cover and the other bent 90 deg. and cemented into a hole broken into the hollow of the brick. Thus, when padlocked, the boxes cannot be entered by such easy means as removing screws or nails from a hinge. Bottom and sides also are lined with slabs of ½-in. belting.

The larger box, termed the "portable mechanical section powder storage," has inside dimensions as follows: 20 in. wide, 40 in. long and 20 in. deep. In each end wall one brick is set so the holes provide ventilation into the box. On the inside the holes are covered with heavy steel screen of ½-in. mesh backed by the rubber lining.

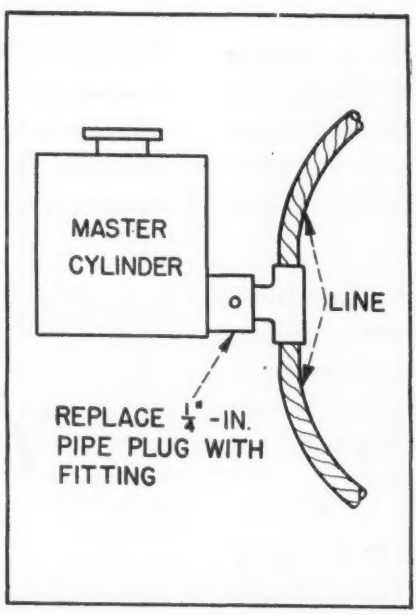
The "portable mechanical section detonator box," much smaller, is 12x12x12 in. inside the rubber lining. Leaning against it in the accompanying illustration are two small wooden boxes in which the shotfirers carry their immediate supplies of detonators. Both the powder and detonator boxes, one each for a loading-machine section, are kept in a break-through barricaded off by wooden fences and a gate marked "Danger" for the protection of all concerned.



Left: Portable mechanical section powder storage. Holes in the ventilating brick near the top are protected on the inside by a steel screen and the ½-in. rubber lining. Right: Portable mechanical section detonator box. Leaning against it are two of the small wooden boxes in which shotfiremen carry detonators to the work face.

Fitting Facilitates Bleeding Hydraulic Lines

IN BLEEDING the hydraulic brake lines on Joy shuttle cars preparatory to refilling them, writes Thomas Jones Jr., head mechanic, Knox Consolidated Coal Corp., Bicknell, Ind., "we found that it was a slow job to keep fluid in the master cylinder and then pump with the bleeder valve open until all the air was removed. So we went to the tee in the copper tubing at the outlet end of the master-cylinder line and put in a ¼-in. Alemite Mogul grease fitting. This allows us to use a Mogul Alemite gun at this point. We now fill up the gun with fluid and put it to this fitting. Then we open the bleeder valve and make a few turns on the gun. This forces all the air out and does not draw any back in, as the master cylinder will do if caution is not used."



How fitting is applied to facilitate refilling hydraulic lines.

Home on Time

It is always great to get the report that everything was running OK at quitting time—and to know that tonight you'll get home on time. Perhaps that operating idea you put to work a while ago helped to bring about this ideal situation. If so, we welcome the chance to publish it. It may help solve the overtime headaches of others. It can be a mechanical, electrical, operating or safety idea and should be accompanied by a simple sketch or photograph. For each acceptable idea *Coal Age* will pay $5 or more on publication.

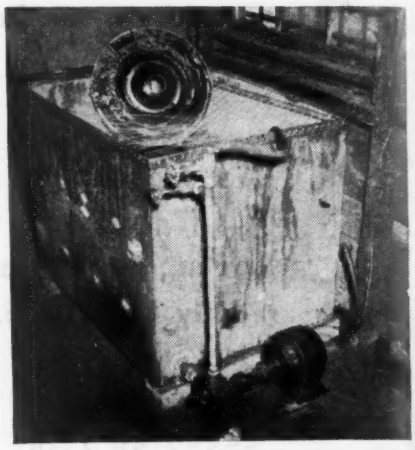
Power Washer for Shop Uses Discarded Parts

WASHING GREASE from machine parts preparatory to inspection and repairing, the first step in shop work, takes considerable time and is a nasty job unless done in a power washer. That such a washer need cost but little and can be built in the mine shop is evidenced by the illustrations showing one in use in the Arista (W. Va.) shop of the Weyanoke Coal & Coke Co.

A rectangular 120-gal. tank built for some other purpose was utilized. A screen of ¼-in. mesh was installed horizontally 8 in. from the bottom, and on top of that is a 3-in. layer of cotton waste. On another screen, supported 16 in. from the bottom, rest the parts being washed.

The pump, from an outmoded ice machine, circulates the solvent liquid to spray pipes positioned along each side near the top edge of the box or tank. When the layer of waste gets contaminated and loaded with grease and dirt until it no longer will allow solvent to pass fast enough to supply the pump, that waste is removed and renewed with a fresh supply.

In the illustration, the bearing housing being cleaned was temporarily placed on edge so it could be seen. Normally it would lie flat on the screen and the cover of the box would be closed. After parts are washed on one side they are turned over. Two valves and a hose to a nozzle allow manual spraying to wash out corners that may have been inaccessible to the jets of the fixed-position sprays.



Sprays of solvent remove the grease.

Motor of Portable Dump Runs Both Hoist and Truck

BY USING a locomotive motor and its matching axle as one truck, a portable slate dump built by the Weyanoke Coal & Coke Co., Arista, W. Va., is made self-propelling and yet requires no extra motor for the rope hoist. The portable unit accomplishes end dumping of lift-endgate cars. The three illustrations showing the approach, hoisting and dumping of a car of slate were made at the new No. 3 mine of the Arista operation. Here the dump is in use building a fill across a ravine to eliminate a curve and considerably shorten the length of an outside main haulway.

Development of this mine is not yet to the point where the dump must work to anything like capacity. At No. 2 mine of the same operation, however, a dump of similar design handles easily the 100 cars of slate that are dumped in one shift.

Track gage at Arista is 56½ in., which is standard railroad gage. Wheelbase of the portable dump is 10 ft. The motor is a Westinghouse No. 902C, series wound, d.c., from a 5-ton locomotive. Normally its pinion meshes with a pinion of an intermediate shift driving the rope hoist, which is mounted underneath near the center of the dump. To be disengaged from the hoist and engage the gear of the truck axle, the motor is pushed over a few inches on the axle to bring its pinion farther from the wheel.

In the illustrations, C. F. Mash, vice president and general manager (left), and Luther Williams, electrical engineer, stand beside the dump while C. I. Nichols, general mine foreman, demonstrates at the controls. Mr. Williams designed and built both dumps. Their use saves considerable labor compared with the hand pushing of cars which was necessary with the stationary horn dumps formerly used.

Car of slate being pulled by rope and about to start up jumper rails to ramp.

Slate car on the way up to the horn dump.

Car in dumped position.

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News Round-Up

Labor Law Revised In New Senate Bill

A federal Labor Relations bill drastically overhauling and amending the National Labor Relations (Wagner) Act, in effect for the last ten years, was introduced in the Senate at Washington June 20 by Senators Carl A. Hatch (D., N. M.), Harold H. Burton (R., Ohio) and Joseph H. Ball (R., Minn.). Modeled after the Railway Labor Act, the new measure would abolish the National Labor Relations Board and substitute for it and for the existing conciliation machinery two separate, independent agencies for bringing peace between management and labor and for averting the "serious danger of a knock-down drag-out fight between management and labor in the immediate postwar period."

The bill sets up an unfair labor practices tribunal of three members, whose authority is limited to administering the quasi-judicial functions of the National Labor Relations Board. All other NLRB functions retained are transferred to a Labor Relations Board of five members, to which is granted broad powers over the mediation, conciliation and adjustment of labor disputes. To this board also is transferred the Department of Labor's Conciliation Service, all mediatory functions of the Secretary of Labor and similar duties of the War Labor Board.

Important provisions of the bill include:

1. Obligatory arbitration of disputes affecting public utilities or public services such as coal, oil or milk, thus banning policies such as those of the United Mine Workers of refusing to work without a contract.

2. Strikes are forbidden and compulsory arbitration prescribed for all grievance disputes that may arise out of differing interpretations of labor-management pacts.

3. Prohibition of unfair labor practices by employers provided in the Wagner Act is retained but is supplemented by extending a similar ban against unfair labor practices by employees. This is an attempt to equalize the Wagner Act provision which has hitherto been sought by industry and opposed by labor.

4. Legalization of a closed shop, as provided in the Wagner Act, if a majority of a union favors it, is modified so that the closed shop would be denied unless the union represents 75 percent of the employees involved; unless the closed shop is ratified by at least 60 percent of the employees involved; unless the union admits any qualified person to membership; and unless provision be made that no member is deprived of membership except on written charges and after a fair hearing.

5. The Wagner Act's broad application to a wide range of business and industry, including that indirectly affecting interstate commerce, is tightened and narrowed to cover employees directly engaged in interstate commerce. The bill limits its application so as to skirt any activity that might be construed as intrastate.

6. The federal board is directed to survey the possible need for legislation to make unions more democratic.

Unequivocal opposition to the proposed law was expressed by William Green, president, American Federation of Labor, and Philip Murray, president, Congress of Industrial Organizations. The United Mine Workers denounced the measure as "a scheme blueprinted to rob the poor and further enrich the rich."

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To Sink New Shaft

Old Ben Coal Corp. has awarded a contract to the Dravo Corp., Chicago, to sink a new shaft half way between its Buckner No. 14 operating shaft and the Rend City mine, closed for several years. The new opening will be an air shaft to enable the company to extend its workings farther into the area of the Rend properties and to reopen the closed operation if it wishes.

•

Congress Considers Tax Adjustment Bill

Designed to bring into being the five-point program recently agreed upon by the Treasury Department and the Joint Staff on Internal Revenue Taxation of Congress, H. R. 3487, the "Tax Adjustment Act of 1945," was introduced in the House of Representatives at Washington on June 18 by Mr. Doughton, chairman of the Committee on Ways and Means. The committee immediately began consideration of the measure.

As introduced, the bill contains the following major proposals: increase in the excess profits tax specific exemption from $10,000 to $25,000, applicable to taxable years beginning after Dec. 31, 1944; change in the provisions relating to postwar refund of excess profits taxes to make the refund and credit available immediately; extension of time for payment of

Forsyth Carterville Coal Co., Carterville, Ill., receives both "Coal for Victory" awards. Fred W. Richart, assistant editor of Coal Age, makes the presentation June 7 to Fred Helen, superintendent (center), and Walter Forsyth, general superintendent (right).

taxes by corporations expecting carry-backs, and tentative carry-back adjustments.

Among changes under consideration by the committee are several proposed by Representative Robertson (D., Va.), who urges that the bill be amended to write into the Internal Revenue Code a termination date for the excess profits tax and also that the higher specific exemption be made effective for taxable years beginning subsequent to Dec. 31, 1944.

Strong representations have been made to the committee by the National Coal Association recommending that the measure be adopted at once and also urging the advisability of raising the specific exemption for excess profits taxes to $35,000, making the higher specific exemption effective for taxable years beginning subsequent to Dec. 31, 1944, and incorporating into the bill a provision that the excess profits tax shall terminate Jan. 1 of the year following the cessation of hostilities with Japan.

•

Laboratory Opened By Indiana Group

A new laboratory furnished with all modern testing and analytical equipment for making analyses and various tests of coals produced in the State of Indiana has been opened by the Coal Trade Association of Indiana at 1240 Hulman St., Terre Haute. It will serve all members of the coal operators' organizations who produce more than 90 percent of the State's output, amounting last year to 27 million tons.

In its work the laboratory will be able to determine the analyses of coals, including moisture, ash, sulphur, fixed carbon, volatile matter and the heating value in B.t.u. It also will have facilities for determining the fusion temperatures of ash and the grindability characteristics of coals. Facilities also are available to make other studies required to determine the best means of producing the highest quality coals. Being located at a point easily accessible to the producing plants, the laboratory can perform its services immediately and promptly report to operating personnel, who, in turn, will be in a position to control quality more closely and consistently produce a better product.

Henry O. Erb, preparation engineer for the Coal Trade Association, is director of the new laboratory. As engineer, Mr. Erb serves the members of the association on all questions of modern preparation methods at the various mines. Analytical work in the laboratory is to be performed by and under the immediate direction of John M. Sanford, a graduate chemical engineer of Rose Polytechnic Institute. Mr. Sanford formerly conducted his own laboratory in Terre Haute.

Other officers of the Coal Trade Association of Indiana, the office of which occupies the fourth floor of the Beasley Building, include the president, Hugh B. Lee, who is vice president and general manager of the Maumee Collieries Co., and the vice president, H. P. Smith, who is president of the Princeton Mining Co. and Black Hawk Coal Corp.

Ohio House Rejects Strip-Mine Measure

The lower house of the Ohio Legislature defeated the bill to regulate strip mining June 19 by a vote of 58 to 53. Governor Frank J. Lausche, who had campaigned on the issue of strip-mine regulation, expressed dissatisfaction over the defeat of the measure.

Rep. Paul Powell's strip-mine tax bill, replacing a 1943 law not now enforced because of court entanglements on its constitutionality, squeezed through the Illinois Senate during the last meeting of the 64th General Assembly with one vote to spare —27-12—and went to the Governor. The measure fixes a tax of 4c. a ton on strip coal and earmarks the revenue for restoration of strip land to tillable form.

The Neel stripping bill, which once had 87 backers in the Missouri House, was killed June 22, 55 to 45. As written, the bill would have required strip miners to refill strip-mined areas and grade down the mounds of dirt they left. Rep. Fred Neel, sponsor of the bill, yielded to an amendment eliminating the requirement that the pits had to be filled, but even that failed to save the measure.

Legislation authorizing State control of bituminous strip mining was signed June 1 by Governor Edward Martin of Pennsylvania. Noting the regrettable destruction of fine farm land by strip-mining operations, Governor Martin commented that it may be necessary for future legislatures to strengthen the act to preserve farm land and include the anthracite region. Under the new mining law operators are required to post a $200 bond for each acre mined up to a $1,000 limit to assure compliance with the statute. License fees were fixed at $100.

COAL ACTIVITY

Bituminous Coal Stocks

	Thousands Net Tons May 1 1945	P.c. Change From Apr. 1 1945	P.c. Change From May 1 1944
Electric power utilities	12,377	−1.1	−11.6
Byproduct coke ovens	4,456	−18.3	−18.3
Steel and rolling mills	695	−4.1	−0.4
Railroads (Class I)	9,508	−4.6	−4.6
Other industrials*	12,831	−2.6	−19.6
Total	39,867	−4.7	−14.9

Bituminous Coal Consumption

	Thousands Net Tons May 1945	P.c. Change From April 1945	P.c. Change From May 1944
Electric power utilities	5,909	−4.5	−9.5
Byproduct coke ovens	7,454	−7.5	−8.2
Steel and rolling mills	850	−9.4	−16.7
Railroads (Class I)	10,592	−7.1	−12.1
Other industrial*	11,379	−12.4	−18.7
Total	36,184	−8.6	−10.8

* Includes beehive coke ovens, manufactured-gas plants and cement mills.

Bituminous Production

May, 1945, net tons	50,030,000
P.c. change from May, 1944	−7.0
January-May, 1945, net tons	244,840,000
P.c. change from Jan.-May, 1944	−7.9

Anthracite Production

May, 1945, net tons	2,124,000
P.c. change from May, 1944	−63.7
January-May, 1945, net tons	21,311,000
P.c. change from Jan.-May, 1944	−22.6

Sales, Domestic Stokers Vs. Oil Burners

	Stokers	Burners
April, 1945	5,737	6,313
P.c. change from April, 1944	+239.8	+196.5
January-April, 1945	22,233	22,217
P.c. change from Jan.-Apr., 1944	+391.5	+133.5

Index of Business Activity*

Week ended June 23, 1945	222.6
Month earlier	227.3
Year earlier	285.1

* *Business Week*, June 30.

Electric Power Output†

Week ended June 23, 1945	4,358,277,000
P.c. change from month earlier	+0.6
P.c. change from year earlier	+0.8

† Edison Electric Institute.

Old Mines Closed; One Reopens

Liberty mine, at the north limits of Gillespie, Ill., operated in recent years by the Perry Coal Co., St. Louis, has been closed. Nat Farnsworth has been mine manager for a number of years, with about 200 men employed. Electrically equipped, the operation was sunk by local businessmen a number of years ago, later being sold to a St. Louis group.

Glen White (W. Va.) mine of the Koppers Coal Div., which produced an estimated 25,000,000 tons since its opening, was closed June 1 because all accessible coal has been removed. Opened in 1909 by E. E. White & Co., it yielded 67,890 tons in its first year of operation and soon became Raleigh County's leading producer. The White firm sold it in 1927 to Castner, Curran & Bullitt, and several years later it was taken over by Koppers.

Industrial mine, one of the oldest in Colorado, ceased operation June 15 following U. S. District Court approval of a Rocky Mountain Fuel Co. request to abandon the 50-year-old Boulder County operation. Harry N. Jones, chief engineer, said only a small quantity of coal is left in the mine and the recent increase in miners' pay made a profit impossible. Opened in 1895 and purchased in 1911 by the Rocky Mountain Fuel Co., the mine has produced more than five million tons, averaging 60,000 tons annually.

Beckemeyer Coal & Mining Co., Beckemeyer, Ill., was scheduled to reopen for business July 1, according to H. H. Timmerman, trustee. Extensive repairs were to be completed sufficiently to make reopening possible on that date. George Guoy is the new superintendent. Plans contemplate doubling the former output.

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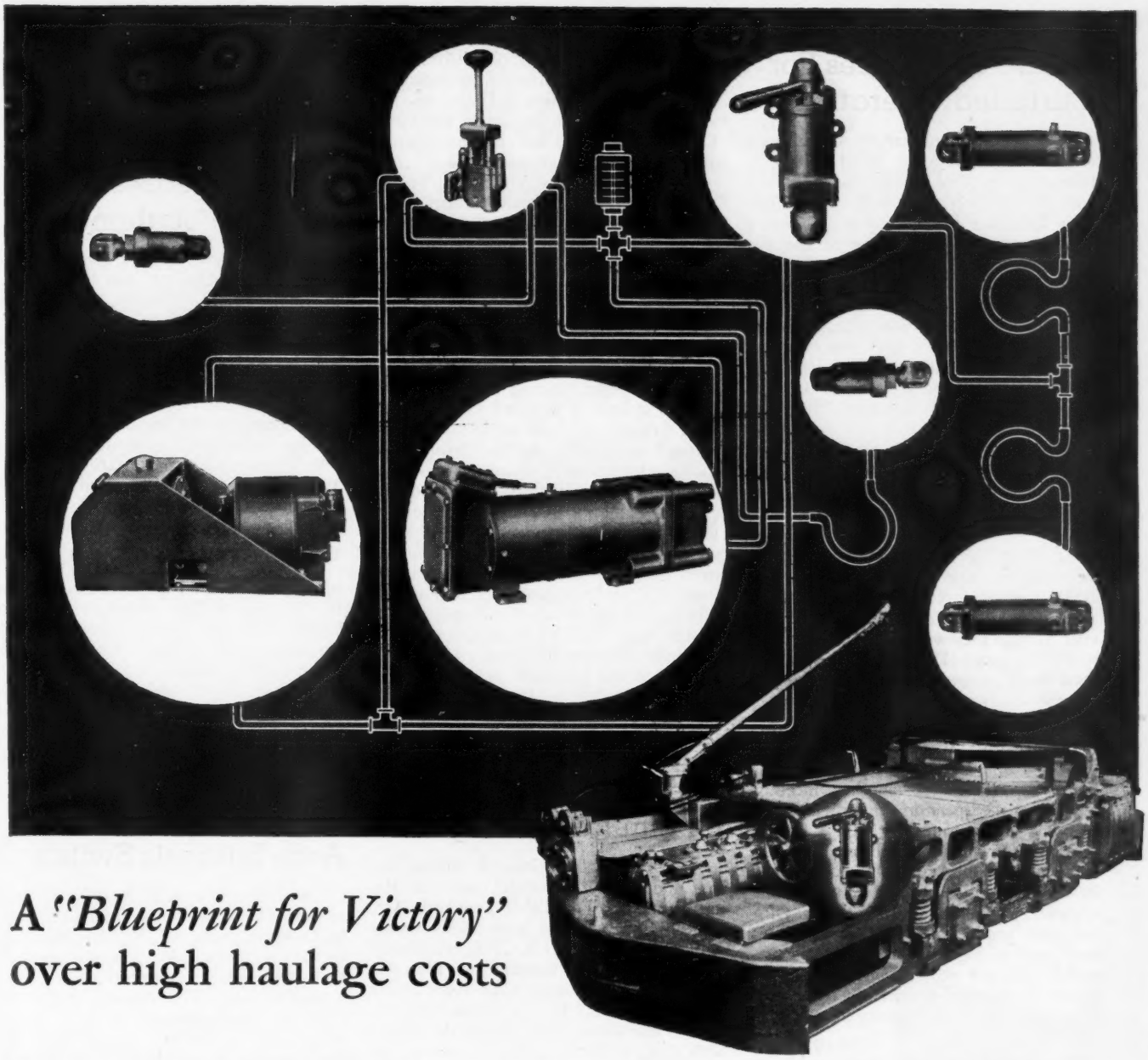
Senate Debates Funds

Department of Interior Appropriation bill, now under debate on the Senate floor at Washington, has been increased in total amount by the Senate Appropriations Committee from the House-approved figure of $102,602,628 to $140,248,932. The Bureau of Mines allowance was restored from $15,881,860 to $23,790,670; the Solid Fuels Information for War was restored from $3,500,000 to $3,730,000.



A *"Blueprint for Victory"* over high haulage costs

One sure way to lick equipment shortages and cut haulage costs is to keep existing equipment out of the shop longer and work it harder. One sure way to get this extra service out of your mine locomotives is to install Westinghouse Hydraulic Brakes.

With the extra control and stopping power that Westinghouse Hydraulic Brakes provide, average speeds on grades can be stepped up—for the motorman knows he can slow and stop the trip at will. Cars can be spotted more quickly and accurately. Such practices as motor bucking, and continuous light application of brakes on long grades, are eliminated . . . extending the life of the motor, and the time between wheel turnings. Simple interlocks automatically apply the brakes if controller handle is accidentally released or when cable is in danger of being pulled from reel.

The blueprint diagram above shows the simple, sturdy, compact parts of the Westinghouse Hydraulic Brakes. No change in existing rigging is necessary, and the equipment can be readily applied to existing locomotives. The savings will soon write off the cost.

We'll be glad to send you a circular describing the Westinghouse Hydraulic Mine Locomotive Brake, if you will write.

Westinghouse Air Brake Company
INDUSTRIAL DIVISION
General Offices: Wilmerding, Pa.
76 Years of Pneumatic Control Experience

Blame OPA Prices For Curtailed Operation

Congressional representatives, coal operators and United Mine Workers officials from western Pennsylvania met June 13 and 14 in Washington with Solid Fuels Price Executive J. H. Reppert and Senior Price Attorney C. F. Kemp to consider the contention of producers that the OPA price schedule is inadequate to meet the needs of that area in the light of the increased cost of production. Charles Baton, president, Baton Coal Co., was chairman of the committee of operators, which included E. A. Siemon, Hillman Coal & Coke Co., and W. F. Schulten, Pittsburgh Coal Co.

Producers asserted that current price levels were responsible for mine shutdowns, elimination of second shifts and layoff of maintenance men in some operations. Richard Maize, Pennsylvania Secretary of Mines, and union representatives warmly supported the operators' contentions. One UMW official stated that 200 small operators in western Pennsylvania faced disaster, though they were making every effort to cut corners. He said 50 percent of these small producers would be unable to pay the vacation allowances.

Need for an additional 10c. per ton over and above the 15c. increase approved by OPA following the wage boost was stressed by the producers at another meeting, June 20 of the operators, union representatives and Congressmen with OPA Deputy Administrator James F. Brownlee. The following day OPA said it was reviewing its decision on prices for western Pennsylvania. In setting prices there, OPA had said production costs in that area were not as high as others and consequently did not need as high a price increase. Continued protests by the operators, however, led the agency to review its decision.

Maintaining that they were unable to operate under the prevailing wage scale with the prices allowed, three mines in Whitley County, Kentucky, were reported to have closed. They are the Blue Gem mine, Gatliff Coal Co.; Mammoth Blue Gem mine, Croley, Ester & Effie Co., and a mine of the White Jellico Coal Co., all operating in thin coal and employing about 300. Dixie Gem mine, Gatliff Coal Co., closed for several months, has reopened since OPA made some price adjustments.

Secretary Ickes released June 14 from government control 260 bituminous mines taken over when they were strike bound by wage disputes. Situated in Pennsylvania, Ohio, Tennessee, Virginia, Kentucky, West Virginia, Illinois, Indiana and Alabama, all except two were taken over in April and May of this year. The other two, those of the Jewell Ridge Coal Corp., Tazewell, Va., were taken over Nov. 1, 1943, and remained in government possession pending the outcome of litigation over portal-to-portal pay.

Twelve more mines were returned June 23 by the government to private operation. With relinquishment of these mines, in Pennsylvania, Kentucky, Alabama and Indiana, six bituminous mines remain in government possession. Three are idle and the other three, owned by the Carter Coal Co., are held because the company and its workers have no contract.

In response to a recent appeal by District 8 Bituminous Coal Advisory Board that more meat be made available to mine workers, OPA suggested that in-plant feeding might ease the situation. It was pointed out, however, that this was impracticable because of the distances apart of working places, loss of time in bringing workers to a common distribution point and in distributing food, which might be deemed as compensable time in view of recent court decisions. The board suggested that meat could be efficiently distributed through company stores and recorded on each worker's payroll account.

A western Pennsylvania coal miner was given a six-month jail sentence June 1 at Pittsburgh for participating in a coal strike in May. Federal Judge F. P. Schoonmaker ruled that William Patterson, 40, of Daisytown, Pa., violated probation imposed on him and 29 others when they pleaded no contest Aug. 30, 1943, to a charge of striking under the Smith-Connally Labor Disputes Act and promised not to interfere with coal production for the duration of the war.

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Federal Statute Of Limitations Urged

A statute of limitations on actions arising under federal statutes such as the anti-trust laws, Fair Labor Standards Act, Walsh-Healy Act and Salary Stabilization Act, as provided by H.R. 2788, introduced by Representative Gwynne of Iowa, is urged by the National Coal Association. Appearing June 11 to urge action along the lines of the Gwynne bill, James W. Haley, of N.C.A., pointed out that at present the time in which claims may be asserted under federal statutes is not clear.

Even where State laws govern legal assertion of rights under such federal statutes, there is a wide difference in the various applicable State law limitations. Moreover, private rights often spring into being as a result of a new bureau interpretation, new court ruling or other happening which may have been wholly unforeseen or even unsuspected.

Hearings began June 21 before the House Committee on Judiciary on the Sumners (D., Texas) bill, H. R. 1203, and a number of other measures designed to regulate procedure in the administrative agencies of the government. Similar bills have been considered in previous congressional sessions, the main purpose being to bring about more just treatment in administrative proceedings; powers of the government agencies are defined and clarified and regulation is provided for the sanctions and penalties they may impose; and judicial review is provided for an adverse rule or order. Witnesses before the committee thus far have been David Simmons, president, American Bar Association; Claude A. Miller, representing the A.B.A. District of Columbia Committee on Administrative Procedure, and Carl McFarland, chairman, Administrative Law Section, A.B.A.

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Atwater Leases In No. 3 Pocahontas

American Coal Co. of Allegany Co., with mines at Crane Creek, Pinnacle and Piedmont, Mercer County, W. Va., has acquired a new lease in the neighboring area of the No. 3 Pocahontas seam. During the last two years or more this company has been exploring the upper and other seams in the area in which it has been mining since soon after World War I and has maintained an output of 1,500,000 tons a year under the direction of H. F. Warden, general manager, and H. W. Payne, general superintendent. The lease is on the lands of the Pocahontas Land Corp.

The American Coal Co. was developed by W. C. Atwater, late founder of Wm. C. Atwater & Co., which is the sales agency that will market the new coal. Officers of the mining company, established in 1851, include J. J. Lincoln, chairman of the board; John J. Atwater, president; George Dies, secretary, and the following directors: W. G. Stephenson, James A. McQuail, Paul Pack, William Beury and Mr. Warden.

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Asco Interests Switch

Controlling interest in Asco No. 1 mine of the Atlantic Smokeless Coal Co., Asco, McDowell County, W. Va., has been purchased by Norman W. Lee, president of the Independent Operators' Sales Co., Arlington, Va. The Atlantic Smokeless Coal Co. has purchased the Asco No. 2 mine from the Atlantic Coal Sales Co. Mr. Lee now is president of the Atlantic Smokeless Coal Co. and George W. Yeager, of Asco, is superintendent. The transaction did not involve any interest in the Darr Smokeless Coal Co., which operates Asco No. 3 mine, on Spice Creek branch of the Norfolk & Western Ry., and the Twin Branch mine, at Twin Branch, W. Va. R. E. Brockman, formerly president of the two Atlantic companies and the Darr Smokeless Coal Co., continues as president of the latter company.

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I. C. to Halt Smoke

Illinois Central R.R. has announced that it will install smoke eliminators on its 80 switching locomotives operating in Memphis, Tenn., before the end of the year. The move apparently was made in anticipation of a city drive to eliminate railroad smoke. The delegation from Shelby County put through at the last session of the State Legislature a bill giving the city the right to govern types of fuel and motive power that may be used by locomotives within the city.

WLB Approves Anthracite Pact; Prices Raised $1 on Domestic Sizes

THE ANTHRACITE wage contract signed May 19 by the United Mine Workers and the hard-coal producers was unanimously approved June 2 by the National War Labor Board. The agreement was reached by the union and the operators after a three-weeks strike which, federal authorities estimated, caused a loss of 3,000,000 tons in production. Two minor modifications proposed by WLB were accepted after conferences by the operators and union representatives shortly before approval of the instrument. William H. Davis, Director of Economic Stabilization, approved the pact June 16 and authorized increases in price ceilings of $1 in domestic sizes and 25 to 50c. on industrial sizes.

One modification was the disapproval by WLB of overtime payment to a group of workers who had not been receiving overtime after seven hours, mainly continuous-shift employees whose regular work day is eight hours and who receive straight-time pay for that period. To have agreed to the contract proposal and to have paid these workers time and a half after seven hours, the Board held, would have meant granting a general wage increase, which is not permissible under wage stabilization policy.

Also disapproved was an overtime provision for employees, such as motor runners, who usually receive a full hour's pay for 15 or 20 minutes beyond seven hours. The Board ruled that these employees should receive the customary payment of one hour for the brief overtime period or time and a half for the actual time worked, whichever was greater. Otherwise, it held, these workers would receive a compound premium.

The order on price changes provided that, effective June 18, dealers whose prices are established under RMPR 122 might immediately increase their maximum prices as follows per net ton: broken, egg, stove and nut, $1; pea, 85c.; buckwheat and rice, 50c.; barley and smaller, 25c.

Mr. Davis said that OPA studies showed that the price increases were necessitated by:

1. Increased labor cost of 60.7c. a ton resulting from the wage agreement, the major portion resulting from the travel-time pay.

2. The fact that operating margins have fallen below the target of 19.9c. a ton realized in 1942 and accepted as a target margin by the Director of Economic Stabilization in his directive of May 26, 1944. The deficiency amounted to 5.2c. a ton.

3. The desirability of permitting operators to recoup, during the balance of the year, the deficiency of 9.2c. a ton in margins incurred during the first five months of the year.

In applying the 19.9c. a ton margin realized in 1942, Mr. Davis expressed the belief that its application for the current calendar year is "necessary to aid the effective prosecution of the war." Expressing agreement with the view of Judge Fred M. Vinson, former Director of Economic Stabilization, that the "industry must be assured that prices will be maintained in such a manner as to insure the target margin," Mr. Davis stated that he had asked for a report from OPA as soon as data are available representing three months of operation under the new price ceilings, with recommendations as to further changes in price ceilings that may be necessary to insure that realized margins do not fall short of and do not exceed the target of 19.9c. a ton.

Secretary Ickes announced June 22 the relinquishment of government control and return to private ownership of the anthracite mines, 354 in Pennsylvania and two in Virginia, accompanied with the plea that the miners make every effort to make up the tonnage lost during the strike.

The text of the new anthracite agreement follows:

This agreement, made this 19th day of May, 1945, between the International Union and Districts 1, 7 and 9, United Mine Workers of America, parties of the first part, and the anthracite operators, parties of the second part, witnesseth:

Whereas, the parties hereto under date of March 8, 1944, entered into an agreement covering wages and conditions of employment in the anthracite coal fields in Pennsylvania, which agreement, under its terms, expired April 30, 1945;

Now, therefore, the parties hereto covenant and agree each with the other as follows:

The provisions of the agreement of March 8, 1944, together with the supplemental agreement of Jan. 9, 1943, and the terms and provisions of the award of the Anthracite Coal Strike Commission and subsequent agreements made in modification thereof or supplemental thereto, including rulings and decisions of the Board of Conciliation and resolutions adopted by previous joint wage conference are hereby ratified, confirmed and continued as provisions of this contract for the full term thereof except as hereinafter modified, supplemented and amended.

EQUIPMENT APPROVALS

Two approvals of permissible equipment were issued by the U. S. Bureau of Mines in April and May, as follows:

Sullivan Machinery Co.—Type 10-RU rubber-tired Universal cutting machine; two motors, 50 and 26½ hp., 230 volts, d.c.; Approval 529; April 2.

Goodman Mfg. Co.—Type E-11 shaker conveyor; 10-hp. motor, 250 volts, d.c.; Approval 531; May 14.

1. Travel Time.

In addition to the rates and compensation provided for under the agreement of March 8, 1944, all inside employees shall be paid $1.132 per shift for travel time with the understanding that contract workers, in keeping with the custom and practice, shall be paid this amount per start. This is on the basis of an accepted and agreed average travel time for all inside employees of forty-five (45) minutes per day, at a rate of $1.006 per hour at rate and one-half, taking into account the extreme difficulty of measuring accurately the actual travel time of individual underground workers.

The payments for travel time herein provided for shall be accepted and construed to be in full settlement and discharge of all travel time prior to May 1, 1945, and in full payment for all travel time for the duration of this agreement.

2. Outside Employees.

In addition to the rates and compensation provided for under the agreement of March 8, 1944, all outside employees, including stripping employees, shall receive $1.32 per day to maintain existing differentials in daily earnings between outside employees and inside employees.

3. Premium Shifts.

All outside and inside company men, consideration miners and consideration miners' laborers, scheduled for and starting work on the second shift shall be paid four (4) cents additional for each hour employed. Contract workers on this shift shall be paid twenty-eight (28) cents per start.

All outside and inside company men, consideration miners and consideration miners' laborers, scheduled for and starting work on the third shift shall be paid six (6) cents additional for each hour employed. Contract workers on this shift shall be paid forty-two (42) cents per start.

4. Vacations.

Vacation compensation for the employment period subsequent to June 15, 1944, shall be at the rate of $75 per year for each employee and payment of the full amount of $75 per year shall be predicated on an employee having worked in each of the 24 semi-monthly pay periods in the year ending June 15, 1945.

Where an employee has not worked in all of the semi-monthly periods for any cause, compensation payable to him shall be a pro-rata share of the $75, based on the number of pay periods actually worked for his employer in said year; provided, however, that time lost by an employee because of injuries incurred on the colliery premises and reported to the colliery superintendent within 14 days thereafter shall be construed as time worked in determining his vacation pay but not in excess of 24 pay periods in the aggregate; and provided further, that no vacation compensation shall be payable to any employee who has worked for his employer in less than six semi-monthly pay periods in each vacation year.

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THE CONFIDENCE miners and operators have in TIGER BRAND Excellay Preformed Wire Rope is well placed. Actual on-the-job comparisons have proved repeatedly that this superior cable is tougher, yet easier and safer to handle than non-preformed wire rope.

U·S·S American TIGER BRAND Excellay Preformed Wire Rope is more flexible. It doesn't kink easily. Spools evenly. Crown wires lie flat and in place when broken. They do not stick out to cut hands or tear clothes of handlers.

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Whatever your material handling, hauling or hoisting job, you'll find an American TIGER BRAND Wire Rope built for the purpose.

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UNITED STATES STEEL

USS STEEL
UNITED STATES STEEL

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TIGER BRAND *Wire Rope*

Vacation compensation for the 1944-45 period shall be paid on the second pay day in June, 1945. In the interest of the national war effort it is agreed that the vacation period shall be eliminated for the year 1945 without prejudice or modification in the existing vacation clause of the agreement. This arrangement shall in no-wise affect the payment of seventy-five ($75) dollars to be paid by all operators to each individual in conformity with the terms of the agreement.

The vacation payment for the 1946 vacation shall be made on the last pay day occurring in the month of June of that year. The 1946 vacation period shall commence at 11:00 p.m. on June 28, 1946, and end at 11:00 p.m. on July 8, 1946.

5. Overtime.

Section 2 (a) of the agreement of March 8, 1944, shall be amended to read as follows: Rate and one-half shall be paid for all hours in excess of seven (7) hours in any one day or thirty-five (35) hours in any one week. Double rate shall be paid for Sunday work if it is the seventh consecutive day worked in any work week, which work week shall begin with the first day shift starting Monday in each week; provided, however, that this provision shall not be construed so as to annul the requirement to pay rate and one-half for time worked on the sixth consecutive day in any work week as provided in the six-day agreement of Jan. 9, 1943.

In order to prevent pyramiding of premium rates, the basic hourly and daily rates used for the computation of overtime shall not include the 37.8 cents paid for 15 minutes of the lunch period, which is continued; the premium rates of four and six cents, respectively, per hour for the second and third shifts provided herein; the sum of $1.132 per day paid for travel time to inside workers; the sum of $1.132 per day paid to outside workers and stripping employees as above provided.

Overtime and premium pay shall not be paid where the regular rotation of shifts requires the working of more than one shift in any consecutive 24 hour period.

6. Tenure of Agreement.

This agreement, made this 19th day of May, 1945, shall be effective as of May 1, 1945, and shall continue in effect subject to the conditions and termination as herein provided. At any time prior to May 1, 1946, in the event a significant change occurs in the government wage policy, either party shall have the right to request negotiations on general wage rates.

At any time on or after April 30, 1946, either party may give ten days' notice in writing of a desire for a negotiating conference upon the matters outlined in said notice. The other party agrees to attend such conference. At the end of 15 days after the beginning of such negotiating conference either party may give to the other a notice in writing of the termination of this agreement, to be effective five days after the receipt of such notice.

7. Miscellaneous.

The third paragraph of Section 7, "Miscellaneous" of the agreement of March 8, 1944, is hereby eliminated.

This agreement is an integrated instrument and its respective provisions are interdependent and shall be effective from and after May 1, 1945, subject to the approval hereof by the appropriate governmental agencies and the granting by the Office of Price Administration of advances in maximum prices to cover the increased costs occasioned hereby.

In witness whereof, the United Mine Workers of America, through their accredited representatives and the anthracite operators, signatories to this agreement, through their accredited representatives, have caused this agreement to be properly executed the day and year first above written.

Provisions for overtime (Sec. 5) were modified by WLB for certain employees as follows:

"(a) Those employees engaged on continuous operations whose regular work day is eight hours and who have customarily received pay at straight time for the eighth hour. The proposal now to pay those employees at time and one-half for the eighth hour amounts to a general wage increase for them not permitted by anything in the wage stabilization policy.

"(b) Certain other groups (as, for example, motor runners) whose normal work day is seven hours but who have customarily been called upon to work in excess of seven hours. These workers have received for such work a full hour's pay at straight time (although actually working only a portion of the hour—frequently, for example, for as little as 15 minutes). These workers, therefore, already receive, in general, more than time and one-half after seven hours. The parties intend to continue their practice of paying a full hour for the work these employees perform after seven hours. To pay for this hour at time and one-half would simply compound the premium which these workers are already receiving.

"It cannot be claimed that an inequity has been created in relation to either of these groups of employees by the travel-time provisions of the agreement, for they, like all other employees in the anthracite mines, are to receive an agreed-upon increase of $1.132 per day.

"In approving the contract, the Board therefore rules:

"1. Respecting (a), such employees are exempt from the overtime provisions of the contract for the eighth hour worked.

"2. Respecting (b), such employees shall receive, after seven hours, the customary payment of one hour or the actual time worked at rate and one-half, whichever is greater."

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Bright Outlook Seen For Coal Utilization

Modern methods of utilizing bituminous coal for home heating and power purposes, with the utmost economy and the least smoke, were predicted as post-war developments by E. R. Kaiser, assistant director of research for Bituminous Coal Research, Inc., when he talked to separate meetings of the Eastern States Blast Furnace and Coke Oven Association and the Mineral Producers' Association held June 22 at the William Penn Hotel, Pittsburgh, Pa. Both talks emphasized that the "future of the bituminous coal industry will be of its own making."

Mr. Kaiser added that the industry has "many opportunities to increase its service to the public through the development of equipment to increase production and dis-

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tribution, and through the development of equipment to increase the efficiency and decrease the inconvenience attending the use of its products."

Stress was laid on the increasing use of overfire air jets, developed by Bituminous Coal Research, Inc., in cooperation with the Louisville & Nashville R.R., which "permit railroad locomotives to operate smokelessly, especially when traveling through cities or moving cars in switch yards." He said that 14 railroads and one barge line have installed or are installing the smoke-eating jets.

The speaker also said it is "necessary that the industry carry on cooperative programs through associations supported by the industry," adding that legislative, research, engineering and public relations activities are now being conducted by such coal groups. He mentioned that B.C.R., the industry's research agency, is developing "machines that will make coal a more satisfactory fuel." One of the newest achievements embodies a smokeless principle, developed for B.C.R. by Battelle Memorial Institute, Columbus, Ohio, which may be applied to heating stoves, furnaces, cooking ranges and water heaters. This research, he said, was accomplished jointly by the coal industry and the stove manufacturers.

A B.C.R. laboratory also is working on a stoker design intended to take coal out of the bin, feed it to the furnace, heat the house and put the ashes in the can, Mr. Kaiser reported. This same laboratory is studying automatic heat with coal through the medium of steam supplied from a small coal-fired boiler plant—of pleasing appearance—in neighborhoods of 50 or more homes, the speaker said. "By this latter method," he added, "home owners will pay for heat monthly, the same as for other utilities."

Working hand in hand, the railroads and the coal industry are utilizing a wartime development, the gas turbine, to design a revolutionary new type of coal-burning locomotive, Mr. Kaiser stated. He said that exploration work is being done by Dr. John I. Yellott, of Baltimore, Md., director of research for the B.C.R. locomotive development committee.

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Reel's Cove Opened; Output Gaining

Tennessee Products Co. on May 30 formally opened its Reel's Cove mine, having completed preparations for full production. Carl McFarlin, Nashville, Tenn., president of the company, accompanied most of the officers and directors for the brief ceremonies and an inspection of the new operation.

The new mine, from which small production has been realized since the first of the year, is five miles north of Whitehall, Tenn., where the company's other two mines are located. Production is now running around 500 tons a day at Reel's Cove, but with the completion of necessary trackage and moving equipment it will be increased to 2,000 tons a day. Coal is delivered mechanically to its lower tipple for grading and loading into railroad cars by use of a 200-ft. tube, an 800-ft. bucket conveyor and a 2,200-ft. conveyor belt 22 in. wide. The drop from mine to tipple is 1,800 ft. Employment in the three mines now totals between 500 and 600 men and at least 100 more miners are needed.

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Rehearing Denied In Travel Time Case

Petitioning a rehearing on the portal-to-portal decision, the Jewell Ridge Coal Corp., in a brief filed May 31 with the Supreme Court, questioned the propriety of Justice Black's participation in the five-to-four decision of May 7 granting travel time pay to bituminous coal miners. The company disputed that Justice Black could "render impartial justice" because of "his connection with the subject matter" and with the chief counsel for the miners, Crampton Harris of Birmingham.

At its sitting June 18, the high court denied the petition for a rehearing. Incident to the denial, Justice Jackson wrote a brief opinion, in which Justice Frankfurter concurred, saying that "no statute prescribes grounds upon which a justice of this court may be disqualified in any case. The court itself has never undertaken by rule of court or decision to formulate any uniform practice on the subject. . . . It appears always to have been considered the responsibility of each justice to determine for himself the propriety of withdrawing in any particular circumstances."

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Tells of German Synthetic Fuel Plants

The story of the German synthetic liquid fuel plants that kept the wehrmacht and luftwaffe operating far longer than many thought possible was reported June 21 to Secretary Harold L. Ickes of the Department of the Interior by Dr. W. C. Schroeder, one of the Bureau of Mines men assigned to a technical oil mission in Germany. Acting chief of the Bureau's Office of Synthetic Liquid Fuels, Dr. Schroeder headed an American party of 22 sent overseas to study the bomb-scattered remnants of the German plants, collect records and research documents, and interrogate plant personnel.

Attributing the German defeat in large measure to the destruction of synthetic fuels plants and paralysis of rail transportation by air attack, Dr. Schroeder reported that the oil plants were being moved underground as rapidly as possible when the collapse of Nazi resistance occurred. A tremendous job because of the space requirements, none of the new underground plants had been placed in operation, but some were about 80 percent completed.

"All of Germany's surface synthetic fuels plants, primary targets of the RAF and American Air Forces, were bombed out—shattered to bits by repeated raids," he said. "Their production, estimated at about 4,000,000 tons of oil a year at the peak, was reduced to below 5 percent of that amount despite the efforts of repair crews numbering as high as 25,000 men for a single plant. Plant production curves, turning sharply downward in 1943, rose only when bad weather grounded the Allied bombers. . . .

"In fact, the Allied bombardiers did their work so thoroughly that we learned very little from the plants themselves, but we got the information we needed elsewhere," Dr. Schroeder added.

"We had a good picture before the war of the German gas synthesis method—used primarily for producing motor gasoline, lubricating oils and diesel fuels—but we learned of several refinements, including the use of iron catalysts and recirculating processes, as well as detailed data on the manufacture of byproducts," Dr. Schroeder stated.

Further information of value will be screened from the mass of records, documents and drawings collected. They will be reproduced on microfilm in London and sent to the United States for translation and use by industry and in the Bureau's synthetic liquid fuels program, a five-year research and development study designed to provide the know-how for the production by private industry of oil and gasoline from coal and oil shale. The investigation was a cooperative one with both British and American scientists collaborating and pooling their findings.

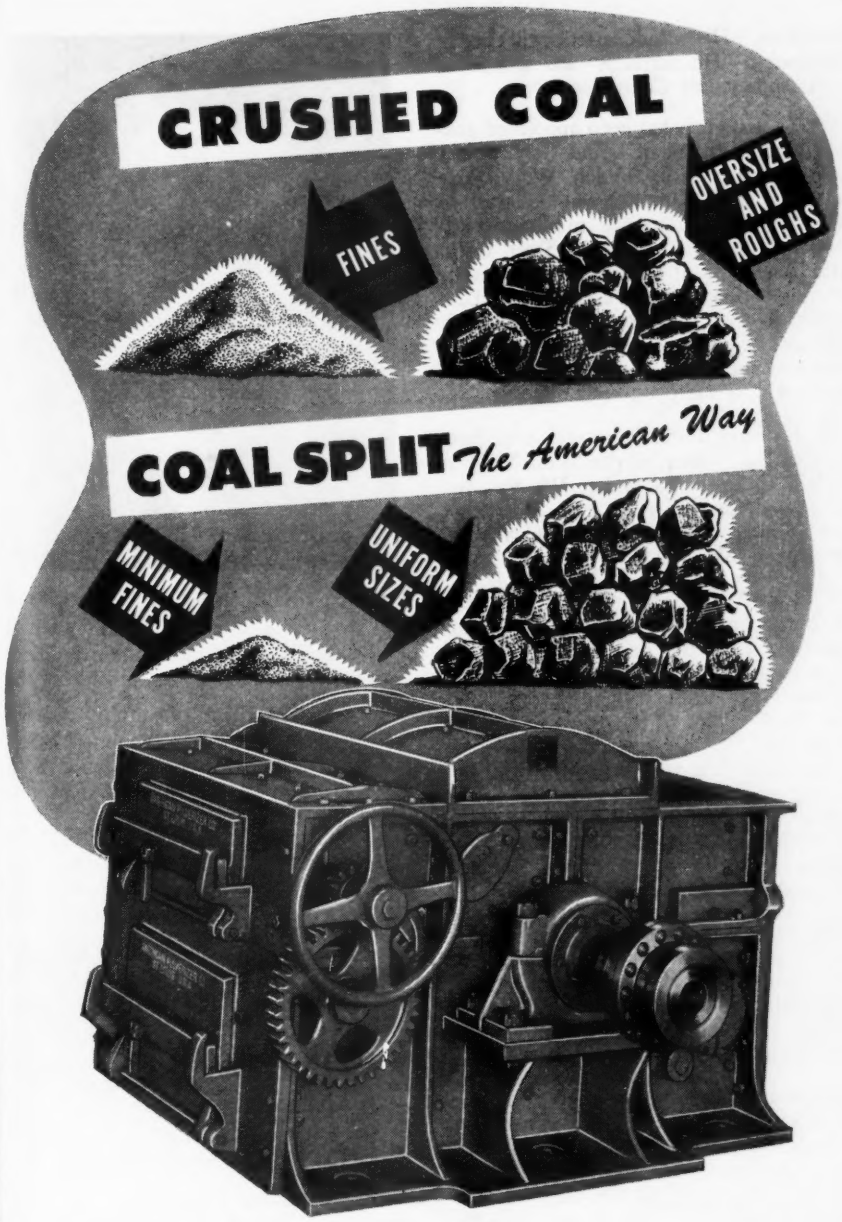
In Europe before the fighting ended west of the Rhine, Dr. Schroeder and others examined the captured Moers-Homburg plant within a half mile of the river bank. Later members of the party examined other plants on the west bank of the Rhine, including those at Wesseling and Ludwigshafen. As rapidly as plants in the Ruhr area were taken, German personnel were interrogated and valuable documents removed. A group of about 15 investigators was kept busy by this work for more than six weeks. Several shale oil plants also were examined.

•

Sets Up Oil-Shale Mining Division

An Oil-Shale Mining Division has been set up in the Office of Synthetic Fuels, with E. D. Gardner, former regional engineer in charge of the Bureau of Mines' Central Experiment Station, Rolla, Mo., as chief of the new division, according to Dr. R. R. Sayers, director of the Bureau. Charged with the responsibility for all mining activities of the synthetic liquid fuels program as authorized by Congress, the new unit will make engineering and economic studies to develop efficient, low-cost methods of mining the oil shale and possibly the coal to be used in producing synthetic gasoline and oil.

At the Bureau's $1,500,000 oil-shale demonstration plant to be built at Rifle, Colo., Gardner and his staff will direct the development of a 200-tons-a-day shale mine that can be enlarged if necessary and supervise the installation and operation of a 1½-mile-long aerial tramway to carry the shale from the mine to the retorting plant. Immediate problems include a choice of



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Reversible, — of the hardest manganese steel — an exclusive patented feature with American Rolling Ring Crushers. Their twenty cutting edges or "teeth" split the coal into uniform sizes governed by the adjustable grinding plate. This controlled splitting action results in a minimum of fines.

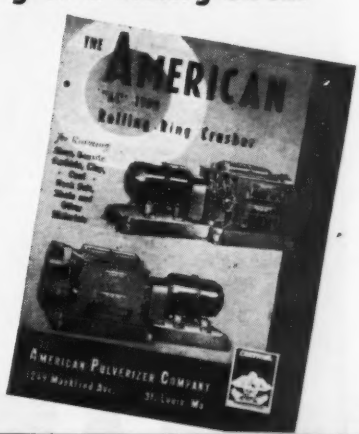
The free centrifugal action of the rings automatically prevents damage — without the use of other safety devices and shear pins.

A great range of reduction made possible by the American Rolling Ring Crusher offers a great improvement in crushing and sizing coal.

The mine run is uniformly split and distributed to grinding and breakerplates where full adjustment permits maximum yield in all sizes of lump, egg, stoker and pulverized sizes.

American Rolling Ring Crushers provide capacities up to 400 tons per hour and operate for less than one cent per ton.

That's speed, greater yield and economy that adds up to efficient, profitable mine operation.



Get all the facts in the 8-page bulletin on "American Rolling Ring Crushers". Sent free upon request.

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mining methods, selection of equipment for mining and conveying the shale and provisions for the health and safety of the miners to be employed. Oil-shale mining research will be conducted at the new oil-shale research and development laboratory being built at Laramie, Wyo.

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Personal Notes

HENRY G. SCHMIDT, chairman of the board, North American Coal Corp., Cleveland, Ohio, has been elected president and chief executive officer, succeeding O. C. LARSEN, president since 1938, who resigned after 29 years' service with the company. The office of board chairman was abolished.

HAROLD M. BEERS, mason foreman in the construction department of the Hudson Coal Co., has been appointed assistant superintendent of maintenance, vice Donald N. Smith, resigned.

CARL WESTERBERG, project manager for the Utah Fuel Co., operating in Carbon County, Utah, has been named superintendent of the Sunnyside mine, vice ARCH MORRISON.

STANLEY C. HARVEY, formerly a Utah State mine inspector, has been appointed mine foreman by the Utah Fuel Co. at its Sunnyside mine, Sunnyside, Utah. He succeeds FRANK MAROSHEK JR.

P. R. PAULICK, consulting mechanization engineer, Library, Pa., will spend some time in Nova Scotia surveying and analyzing the possibility of installing mechanical loading equipment in several independent coal mines in that district.

T. A. DAY, special representative with Island Creek Coal Sales Co., has been appointed special representative by Bituminous Coal Research, Inc., for which he will conduct public relations activities and maintain contact with members, coal producers, associations of coal-mining companies, railroads and manufacturers of coal-burning equipment for homes and industries. His headquarters will be in Pittsburgh. He formerly was associated with Appalachian Coals, Inc.

T. A. Day

R. G. LAZELLE has been appointed general superintendent of Island Creek mines with headquarters at Holden, W. Va. He succeeds E. R. COOPER, who resigned to accept a position in the mining department of Jones & Laughlin Steel Corp. Mr. Lazelle joined Island Creek soon after his graduation from West Virginia University in 1922, and has since held such positions as assistant mine superintendent, operating superintendent and mining engineer for all the company's mines.

S. A. JONES, formerly general mine foreman of No. 5 mine of the West Virginia Coal & Coke Corp., Omar, W. Va., has been made superintendent of Nos. 2, 4 and 6 mines of the Merrill Coal Co., Henlawson, W. Va.

CLYDE WILLIAMS, director, Battelle Memorial Institute, Columbus, Ohio, was presented with the degree of Doctor of Science at recent convocation ceremonies of the Case School of Applied Science, Cleveland, Ohio. The degree was conferred by Dr. William E. Wickenden, president of Case, who cited Mr. Williams' accomplishments in research administration and in directing the activities of the War Metallurgy Committee of the National Academy of Sciences and the National Research Council.

THOMAS M. BEANEY, superintendent of No. 6 colliery, Jermyn-Green Coal Co., Pittstown, Pa., has been appointed by Governor Martin as an anthracite mine inspector. He succeeds Frank Kettle, who resigned after many years of service.

GRIFFITH MORRIS has been appointed director of the Bureau of Mines and Minerals in the Indiana Division of Labor by Governor Bates. Working in coal mines for 46 years, much of the time as mine foreman, and for the last 20 years in Kings Station mine of the Princeton Mining Co., lately as safety man, he succeeds Henry S. Wallace, director since 1941.

LOREN WASSON, hitherto assistant general manager and general superintendent, Wasson Coal Co., Harrisburg, Ill., was elected president and general manager June 6, succeeding his father, recently deceased.

A. B. CRICHTON, president, Johnstown Coal & Coke Co., Johnstown, Pa., has been elected a director of the National Coal Association, representing the Maryland district, where his company has a mine in addition to operations in Pennsylvania and West Virginia. He succeeds Arthur B. Stewart, who recently disposed of his interests in the Davis Coal & Coke Co., Baltimore, of which he had been president, and who has retired.

B. H. SCHULL, vice president in charge of operations, Binkley Coal Co. and Pyramid Coal Corp., has been relieved of active duty because of his health. He will continue his relationship with the companies in an advisory capacity. He has been engaged in the coal-mining business, both underground and strip, in Indiana and Illinois for 40 years.

B. H. Schull

C. B. LANG has been appointed executive vice president of the Dominion Steel & Coal Corp., Ltd.; Dominion Coal Co., Ltd., and Nova Scotia Steel & Coal Co., Ltd., with offices in Montreal. R. C. McDonald has been named secretary-treasurer and G. C. Broadbent, assistant secretary-treasurer of these companies.

GARRETT CREWS, formerly of the engineering department of the Union Colliery Co., Dowell, Ill., has been promoted to assistant to the general superintendent.

E. B. AGEE, formerly general superintendent, Buckeye Coal Co., Nemacolin, Pa., has been appointed a general manager of the Simpson Creek Collieries Co., Galloway, Harrison County, W. Va.

L. L. ARNETT, Castle Gate, has been appointed a district coal-mine inspector by the Utah State Industrial Commission. He succeeds I. P. Benensen, Kenilworth, after 38 years' coal mining experience in Utah, Colorado and Illinois.

•

Accident Rate Cut In Drumheller

Results of Drumheller's (Canada) Accident Prevention and Safety Program are reflected in a marked decrease in accidents during the first six months. The total between Dec. 1, 1944, and May 31, 1945, was 684 compared with 925 a year earlier and 1,053 two years previous. Three mines in East Coulee have combined their safety work to a considerable extent and have provided the services of a nurse in addition to first-aid accommodation.

Sponsored by the Drumheller Coal Operators' Association, a gala program was arranged for July 2 at Drumheller to mark six months' operation of the safety campaign. Cash prizes totalling $1,000 were to be drawn for by steady working mine workers with accident-free records. Besides

In this Vulcan heavy duty mine hoist the gears that transmit 600 HP from drive motor to hoist are of the Farrel-Sykes continuous tooth herringbone design—the famous *Gear with a Backbone.*

Because there is no center groove, the entire face width is put to work. The *backbone* formed by the continuous teeth gives mine hoist gears that extra margin of strength and load-carrying capacity which assures continuous dependability, an important factor where human safety is concerned.

Because they are precision generated by the Farrel-Sykes process, these gears are exceptionally quiet and smooth-running, even at high speeds, and in either direction of rotation. In hoists equipped with Farrel-Sykes gears, power transmission is equally smooth and efficient UP or DOWN.

There are other factors which contribute to efficient operation and long gear life. For further information send for descriptive bulletin.

The 600 HP mine hoist shown above, designed and built by Vulcan Iron Works, Wilkes-Barre, Pa., is equipped with Farrel-Sykes continuous tooth gears.

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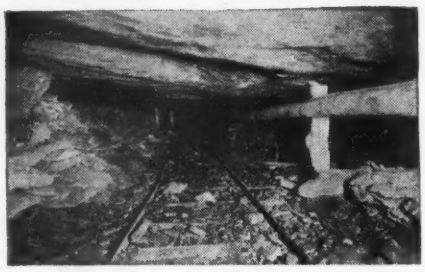
FARREL
The Gear with a Backbone

Farrel-Birmingham

APPROVED VENTILATION
helps cut costs

By W. E. BROWN
Member, American Institute
of Mining Engineers



Tubing delivering good air at the face in spite of irregular entry

THE IMPORTANCE OF blower-tubing systems in lowering production costs is recognized by many mine operators. The use of a blower and Du Pont "Ventube" rubberized duct quickly sweeps the face with clean air. Thus, the time cycle after shooting is reduced. And blower-tubing speeds up entry driving. It makes thin seam mining more practical by helping to make it possible to maintain maximum spacing between crosscuts consistent with local mine regulations. These advantages mean lower overhead and production costs, and better all-around working conditions.

In view of these potential gains, operators specify that methods approved by local mine laws be used in installing and handling blower-tubing systems. For example, the blower should have a permissible motor and adequate air capacity. It should be set in a secure position at least 15 feet upstream from the last crosscut or room neck. "Ventube" should be suspended from the roof by messenger wire. This prevents it from being damaged by men, gob and equipment. In order to conduct air properly the tubing should hang in a straight line. When it's necessary to bend the tubing sharply, elbows should be used. The blower-tubing system should be operated continuously to keep the face clear at all times. If the blower is stopped between shifts, or at any other time, the area should be inspected for presence of gases. If present, these should be removed by approved methods.

* * *

"Ventube" is Du Pont's registered trade mark for its flexible, rubberized duct. For more details on how "Ventube" can help cut costs in your mine, write: E. I. du Pont de Nemours & Co. (Inc.), Fabrics Division, Fairfield, Conn.

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BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

BUY BONDS AND WAR STAMPS!

which other prizes were to be awarded, including the silver trophy of the Safety Supply Co. and another provided by Canadian Industries, Ltd. Canadian Utilities, Ltd., and the Canadian Sullivan Machinery Co., Ltd., also each contributed three attractive prizes.

•

Gas Case Taken To Supreme Court

The National Coal Association has asked the U. S. Supreme Court to review the recent action of the Fifth Circuit Court of Appeals in affirming an order of the Federal Power Commission authorizing construction of facilities to increase the quantity of natural gas available in the Memphis market area. The State of Louisiana had previously petitioned the Supreme Court to issue a writ of certiorari in the case, and the N.C.A. petition and the United Mine Workers support the position taken by Louisiana. Louisiana has obtained from the Fifth Circuit Court a stay order pending disposition of the case by the Supreme Court. As the Supreme Court did not act on the petitions for certiorari at the final session of the court, June 18, it will be autumn before the court can act on the petition.

A limited certificate has been granted by the Federal Power Commission to the Tennessee Gas & Transmission Co. authorizing the operation of new compressor stations and other new equipment to bring additional natural gas into the Appalachian area. At the same time the Commission denied the company's application for permission to construct 95 miles of 16-in. pipeline to make a connection with the San Salvador gas field in Texas.

More Gas for Southern Cities

F.P.C. is now considering an application of the United Gas Pipeline Co. to increase its facilities to make additional quantities of gas available in Atlanta and other market areas in the South, as well as to make additional gas available to the Tennessee Gas & Transmission Co. This matter was submitted to the Commission on oral argument following lengthy hearings, in the course of which the coal industry pointed out forcefully that the additional gas was not needed and would tend to impair rather than promote the general welfare of the territory sought to be served.

An application has been filed with F.P.C. by the Southern Natural Gas Co. seeking authority to add 93 miles of main-line loop and several segments of branch-line loop and to install compressor stations and other auxiliary equipment to increase the capacity of the line from 220 million cubic feet per day to 245 million cubic feet per day. The principal communities served by Southern and its vendees are Atlanta, Birmingham, Gadsden, Montgomery, Macon, Rome and Columbus. Hearing has been set for July 19 at Washington.

Briefs have been filed by representatives of the coal industry in the proceeding before the Public Service Commission of Wisconsin concerning the application of

"Riding Comfort"

FOR INDUSTRIAL MACHINES

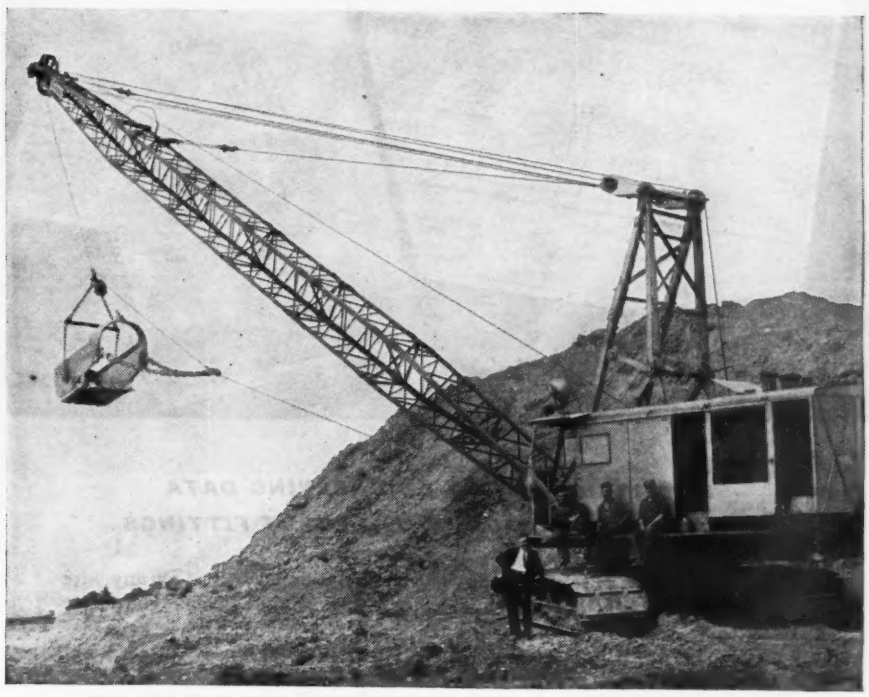
Smooth operation, and freedom from shocks and vibration, are just as important in your heavy-duty machines as they are in your motor vehicles.

Now, for the first time, you can give your machines true air-cushioned "riding comfort" with the Fawick Airflex Clutch.

This new clutch controls power and torque through a cushion of air and rubber. Regulated inflation gives you clutch engagement as light or as firm as the job demands. There are no springs, arms or toggles, no adjustments to make, no lubrication required. Misalignment is corrected automatically. Maintenance costs are usually low. Both drive and driven members have new nonmetallic safety and protection.

Our experienced engineering department will gladly give you recommendations for your machines.

THE FAWICK AIRFLEX CLUTCH provides air-cushion clutch action because it matches today's fine motor vehicle tires in quality of material and excellence of workmanship — the result of the great technical advances made by America's Rubber Industry.



ARMY (E) NAVY

For shovels, cranes and draglines, Fawick Clutches stand fast starts and stops, shock, strain and vibration. Maintenance costs are unusually low—equipment *stays* in service.

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FAWICK *Airflex* CLUTCH

POWER CONTROLLED BY AIR

the Wisconsin Southern Gas Co. for authority to construct a gas transmission line into the southern part of the State.

Hearings before F.P.C. on the application of the Central Illinois Public Service Co. were concluded June 16. Granting of the certificate sought was opposed by the National Coal Association, United Mine Workers and the Indiana and Illinois coal operators. If the certificate is issued the section around Mattoon, Ill., will receive additional natural gas from either Kentucky Natural Gas Corp. or Panhandle Eastern.

The first hearing in the general natural gas investigation, it is understood, will take place in Washington some time in September. George Slaff has been appointed chief counsel for F.P.C. in the investigation and a staff of other lawyers and technicians also is being assembled for the probe. It also is understood that the natural gas industry, operating through the recently organized Independent Natural Gas Association of America, is assembling a staff of attorneys and engineers to participate in the proceedings.

•

New Pumping Plants In Anthracite Field

To supply more water to the St. Nicholas breaker, the Philadelphia & Reading Coal & Iron Co. will install in its St. Nicholas mine, St. Nicholas, Pa., two deep-well pumps each with a capacity of 5,000 g.p.m. An 11x11-ft. shaft 200 ft. deep is being sunk to accommodate the pumping equipment.

A new automatic pumping plant is being installed also in the Prospect colliery of the Lehigh Valley Coal Co., Wilkes-Barre, Pa. Its ultimate capacity will be 5,600 g.p.m. against a total head of 850 ft. The water will be pumped to the surface through a 16-in. lead-lined pipe in a 23-in. borehole.

•

Ohio Group Buys Puritan Coal Corp.

Puritan Coal Corp., Mingo, W. Va., has been purchased by C. L. Fishback, president, Michigan & Southern Coal Corp., Columbus, Ohio, and associates. The Puritan company produces about a quarter of a million tons of coal a year and is served by the Norfolk & Western Ry. Officers, in addition to Mr. Fishback, who will be chairman of the board, are Frank P. Smith, Puritan, W. Va., president; James D. Ireland, Cameo, W. Va., vice president; H. L. Thompson, Cincinnati, treasurer, and C. L. Fishback, secretary.

•

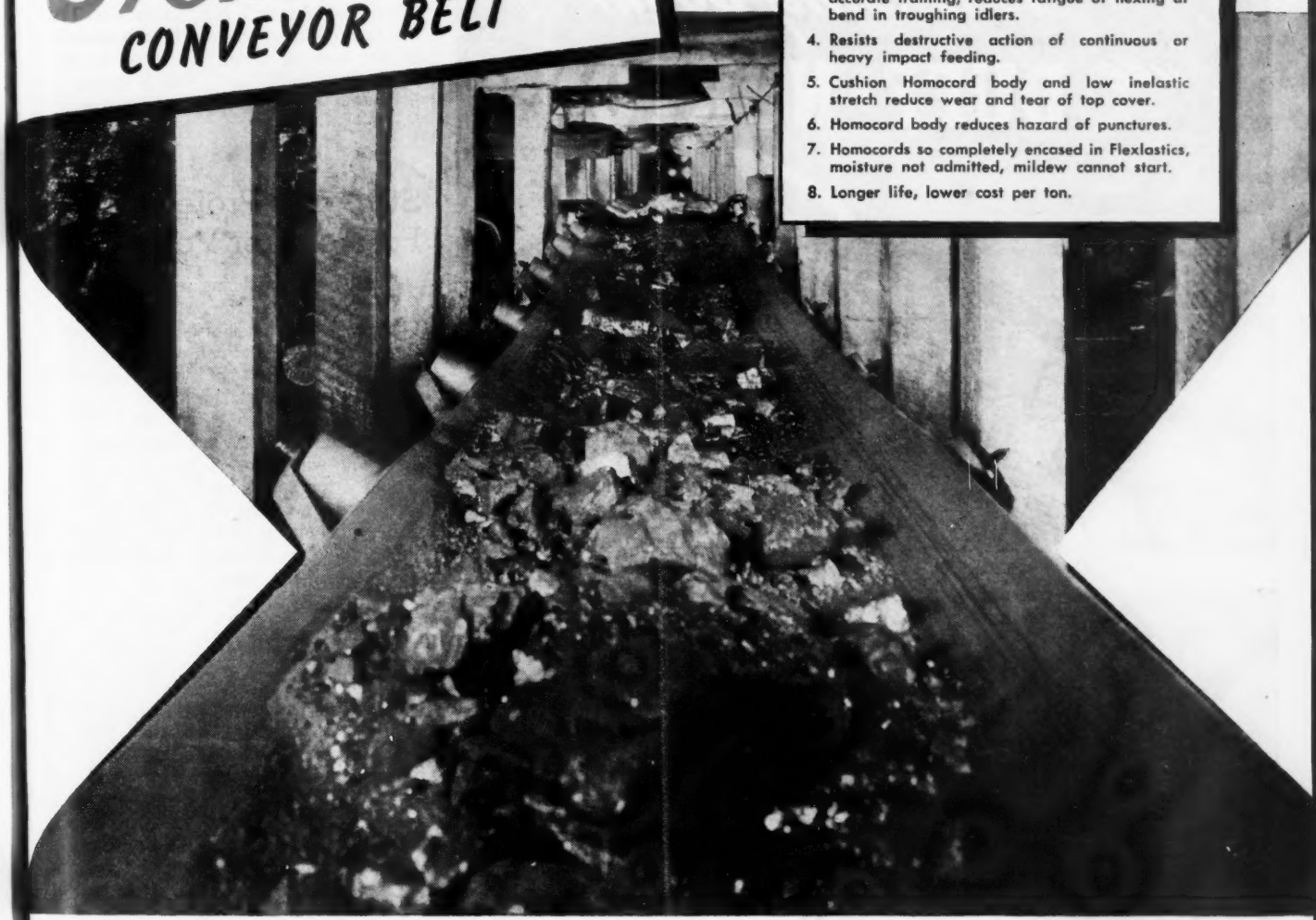
To Raise Capacity

Path Fork mine, a new operation of the Blue Diamond Coal Co. near Alva, Harlan County, Ky., is now shipping two to three cars of coal per day. It probably will be increased to a capacity of 25 cars per day.

You lower per-ton costs with every *Homocord* CONVEYOR BELT

8 ADVANTAGES

1. Complete bonding of every member into a homogeneous structure.
2. Holds metal fasteners.
3. Lateral flexibility permits perfect troughing, accurate training, reduces fatigue of flexing at bend in troughing idlers.
4. Resists destructive action of continuous or heavy impact feeding.
5. Cushion Homocord body and low inelastic stretch reduce wear and tear of top cover.
6. Homocord body reduces hazard of punctures.
7. Homocords so completely encased in Flexlastics, moisture not admitted, mildew cannot start.
8. Longer life, lower cost per ton.



for longer belt life and exceptional troughing for full loading

Every Homocord Conveyor Belt has engineered into it the *Eight Homocord Advantages.* Every Homocord Conveyor Belt possesses the virtues of a cord belt, but with the drawbar strength and resistance to fatigue to hold metal fasteners. Every Homocord Conveyor Belt provides exceptional troughing for full loading and training.

Component Strength Members, sealed-in with moisture-proof Flexlastics, and mildew-proofed for added protection, have flexible, resilient, rolling contact with each other to provide cushioned resistance to heaviest feed impact and protect the tough wear-resisting cover from abrasion and puncture.

Other brands of MANHATTAN Conveyor Belt for special services are also made with Flexlastics and specially designed Strength Members to distribute load strains uniformly. All are mildew-proofed for underground service, oil-proofed where needed, and compensated to equalize ply stresses over small pulleys.

The term FLEXLASTICS is an exclusive MANHATTAN trade mark. Only MANHATTAN can make FLEXLASTICS.

MANHATTAN Conveyor Belts

CONDOR Trolley Wire Guard

CONDOR Mine Dusting Hose Mine Suction Hose

CONDOR Homo Flex Air Hose

Fire Hose Radio-Active Mildew-Proof

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EXECUTIVE OFFICES and FACTORIES . . . PASSAIC, NEW JERSEY

State Will Take Over Schuylkill Dams

An appropriation of $25,000,000 having been provided to clean the Schuylkill River, the State of Pennsylvania has agreed to take over certain dams in the river from the Schuylkill Navigation Co. They will be dredged to remove the accumulation of silt now in them, estimated to total about 30,000,000 tons. This is one of the first steps by the State to clean the silt-clogged river.

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Stripping Project For Panther Valley

Equipment was being installed in mid-June by Carey, Baxter & Kennedy, New York, on the west side of Greenwood mines in Panther Valley, Pennsylvania, preparatory to launching the largest stripping operation yet undertaken in the anthracite region. The Lehigh Navigation Coal Co. let the contract. When completed the operation will form an enormous V-cut having a top spread of 1,200 ft. and legs extending downward 850 ft., one leg lying along the bottom rock of the Mammoth Vein. The over-all length of the stripping will be nearly one mile.

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Obituary

JAMES H. ALLPORT, president, Rich Hill Coal Co., Barnesboro, Pa., died June 12 at his home in that community. By profession a mining engineer, he served during World War I as chief engineer of the U. S. Fuel Administration as well as a member of the engineers' committee that made a comprehensive study of coal-mining costs throughout the United States. He also served as a member of the Engineers' Advisory Valuation Committee to the U. S. Coal Commission in 1923.

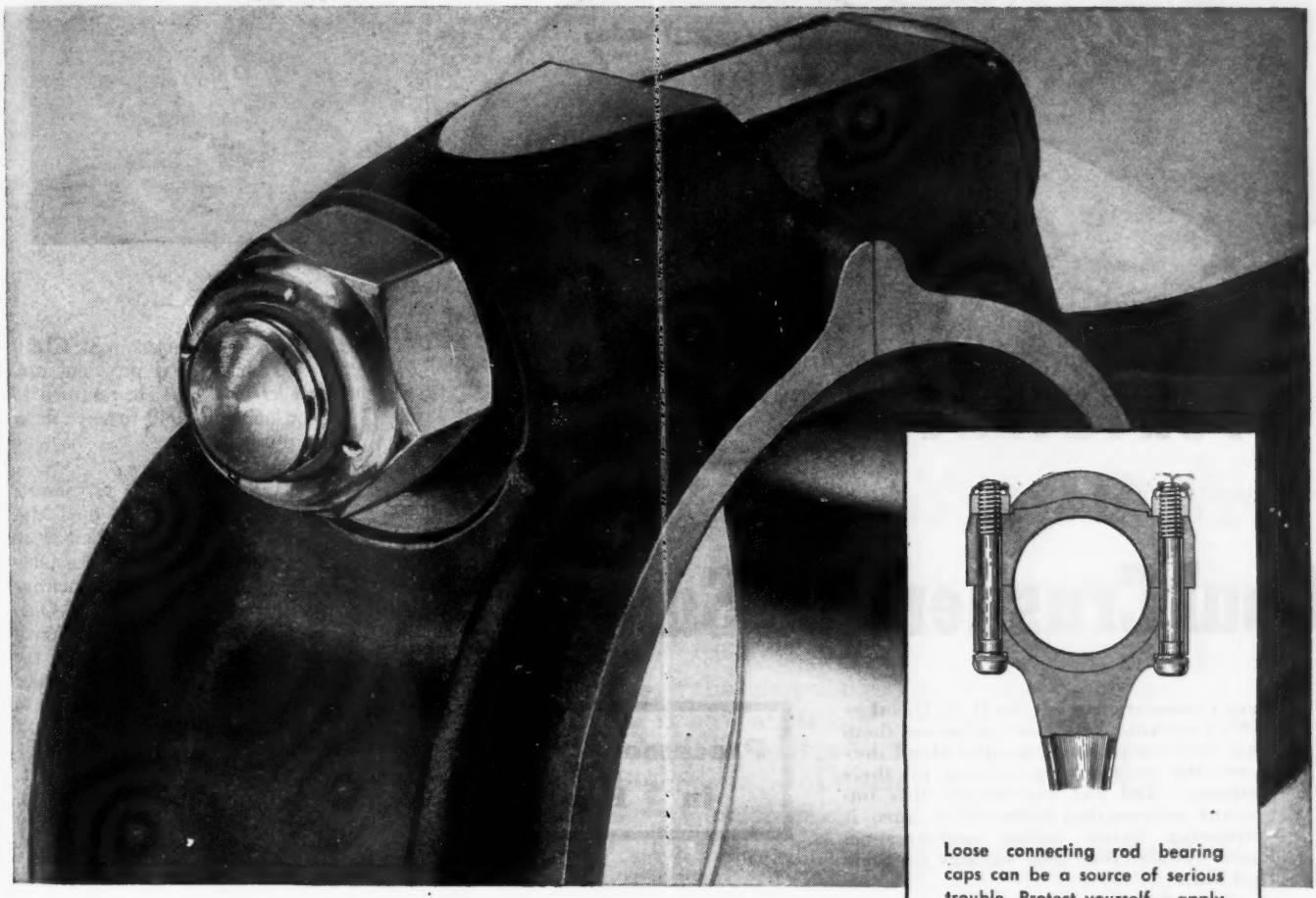
ROY WILLIAMS, 56, superintendent, National Fuel Co., died June 23 in a Boulder (Colo.) hospital.

W. P. BROSS, 70, vice president, Sinclair Coal Co., Kansas City, Mo., died June 20 after only a few days' illness. He had been with the Sinclair for 25 years, much of the time as general sales manager.

JOE B. MOORE, president, Three Forks Coal Co., Ellamore, W. Va., died May 30 at Philadelphia, Pa.

ROBERT V. CLAY, known to his many friends as "Barney," vice president of the Hanna Coal Co., died June 8 at Cleveland, Ohio, of a heart attack. He started with the company in 1910 as an office boy, later working in the accounting department in Cleveland, and coal-mine offices in Pennsylvania. After serving as a sergeant overseas in World War I he joined the Susquehanna Collieries Co., anthracite subsidiary of the Hanna company. In 1925 he returned to the Cleveland office to become purchasing agent. In 1928 he was appointed assistant general manager of the

CORRECT *for connecting rods*



Loose connecting rod bearing caps can be a source of serious trouble. Protect yourself — apply Elastic Stop Nuts; they hold fast. This, or any other nut, won't stop bearing wear or bolt stretch, but it can remedy connecting rod troubles resulting from loose nuts.

Make certain that the bolt extends completely through the collar.

THIS NUT ALWAYS HOLDS FAST

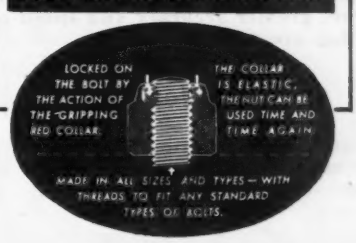
Under tough operating conditions, on connecting rod bearings for instance, the Elastic Self-Locking Stop Nut does its job, by gripping fast. An ordinary castellated nut or jam nut might break loose, lose its grip and fail, and so would the parts it is assigned to hold together.

But not the Elastic Stop Nut. It uses its head—for, built into the head of this nut is a locking device, an oil-resistant elastic compression collar. This forms itself to the individual bolt thread, grips it tight. The nut won't loosen or back off under the severest vibration, shock or impact.

You need no cotter pins, no lock-washers or other auxiliaries when you use Elastic Stop Nuts. Thus there is no possibility of broken bits of these extras in the crankcase. Nor is there any distortion of or damage to the bolt or the cap. Made to fit any standard bolt or stud, Elastic Stop Nuts can be used over and over again with fully adequate gripping power. You can turn this nut up to the exact torque you need and be sure it will stay there.

Here is definite insurance against loose bearing caps which means greater safety and reliability in use; greater economy in assembly and maintenance.

LOCKS FAST TO MAKE THINGS LAST



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Plants at: Union, New Jersey and Lincoln, Nebraska

Sales Offices: 1060 Broad St., Newark 2, New Jersey

Robert V. Clay

Ohio mines with headquarters in St. Clairsville, and was made vice president and general manager in 1932. He returned to the Cleveland office in 1940 to serve in an administrative capacity.

HENRY (HARRY) LAVIERS, 83, pioneer eastern Kentucky coal operator, died May 31 at Paintsville, Ky. An immigrant at an early age, he worked in northeastern Ohio and West Virginia mines, supplementing his mining education by study at Ohio State University. In 1905 he transferred to Paintsville as general manager of the North-East Coal Co. and superintended opening of its four mines. Later he became associated with the South-East Coal Co. He served as first president of the Northeast Kentucky Coal Operators' Association, predecessor to the Big Sandy-Elkhorn Coal Operators' Association. His son, Harry LaViers, is president of the Princess Elkhorn Coal Co.

C. M. WASSON, 76, president and general manager, Wasson Coal Co., Harrisburg, Ill., died May 31 in a Chicago hospital. He also was a director of the Oliphant-Wasson Coal Co., Bicknell, Ind.; Wheatland Coal & Mining Co., Wheatland, Ind., and the Princeton Coal & Mining Co., Princeton, Ind. Long a leader in community and church affairs in his community, Mr. Wasson was a heavy contributor to various church activities. Mr. Wasson started his business career with his father in the cattle and grain trade and also engaged in the commission business. He entered coal mining by participating in the organization of the Saline County Coal Co., which was sold in 1905 to the O'Gara Coal Co. In 1906 he organized the Wasson Coal Co. and sunk Mine No. 1, still in operation, later going into other mining, oil, retail coal, manufacturing and banking concerns, some of which he helped organize.

ROBERT M. TIMPANY, 58, who served the Peabody Coal Co. in Illinois for many years in various management capacities—recently at Springfield—died June 19 in a Springfield hospital after a long illness.

L. & N. Line to Open New Harlan Field

About 140,000,000 tons of high-grade coal is to be tapped by the Louisville & Nashville R.R.'s new Clover Fork Branch, which will be known as the Clover Fork Extension, approval of which has been granted by the War Production Board and the Interstate Commerce Commission. The line will begin at Golva, Ky., where it is to connect with the Cumberland Valley Division's Clover Fork Branch and extend to the headwaters of Clover Fork. Contracts for construction have been let and work was to begin early in July.

The 12-mile line, which will be wholly in Harlan County, will open up some 23,000 acres of coal lands on Big Black Mountain and Little Black Mountain, which rim the valley of Clover Fork. The new line will cost about $1,515,000 and is scheduled to be completed late next year.

The new acreage is owned largely by the Blackwood Land Co., United States Coal & Coke Co. and the Stonega Coke & Coal Co. The last named will open a large modern mine and tipple installation to be known as the Glenbrook mine near the end of the railway. Production for the first year is to be about 600,000 tons; the second year, 900,000 tons, and thereafter 1,200,000 tons annually.

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Preparation Facilities

Elk Lick Coal Co., Gualey No. 2 Mine, Jerryville, W. Va.—Contract closed with Fairmont Machinery Co. for complete steel preparation plant with loading facilities for seven railroad tracks; sizes to be prepared are 7-in. lump, 7x3, 3x2¼, 2¼x1¼, 1¼x¾, ¾x¼ and 0x¼ in.; mine-run capacity of the plant, 300 t.p.h., including Chance equipment to clean 7x1¼-in.; there will be facilities for hand picking plus 7-in. lump and this size also can be crushed to a minimum of 2 in. and fed to the washer; remixing facilities to be provided for 0x¼ and ¾x1¼-in. sizes; complete new plant to be in operation by Jan. 1.

Rochester & Pittsburgh Coal Co., Waterman No. 2 Mine, Waterman, Pa.—Contract closed by Fairmont Machinery Co. with Heyl & Patterson, Inc., for Chance cone equipment to handle ¾x⅛-in. coal; addition to existing plant, designed for a maximum capacity of 225 t.p.h.; to be in operation soon after Jan. 1.

Mountain Fuel Co., Glen Cambria Mine, Brownton, Barbour Co., W. Va.—Contract closed with Fairmont Machinery Co. for replacement set of shaker screens to prepare lump, egg and slack; run-of-mine capacity, 250 t.p.h.; to be in operation by Oct. 1.

Morrisdale Coal Co., Maxton Slope Mine, Morrisdale, Pa.—Contract closed with Morrow Mfg. Co. for addition to existing preparation plant; equipment to consist of crusher, vibrating screens, Link-Belt air-pulsated jig, conveyors, etc. housed in steel structure; capacity, 250 t.p.h. 5x⅜; to be completed about Nov. 1.

Red Jacket Coal Corp., Junior Mine, Red Jacket, W. Va.—Contract closed

IN ALABAMA COAL MINE 2 TOURNAPULLS STRIP 3000 YARDS PER 10 HOURS ON 800' AVERAGE ONE-WAY HAUL

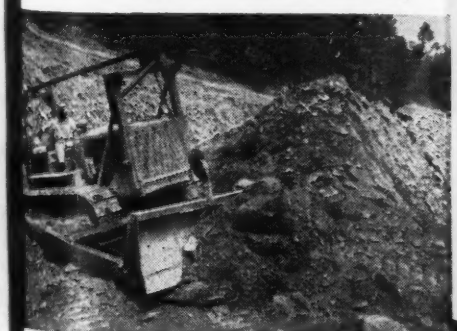
urnapulls dig through 21' of clay d shale to 4' of solid rock over e 30" coal seam. Crawling tractor sh-loads first Tournapull, snatch-ds second, to save turning time.

NEAR JASPER, ALA., S. R. Batson Co. of Birmingham use two Super C Tournapulls to strip a 54-acre coal mine, removing 18' of clay and 3' of shale, while a 1½-yard shovel follows to take out 4' of rock over a 30" coal seam. The seam sometimes pitches to 40° and is worked across the pitch, with Tournapulls loading at an angle downhill and heaping 15-yard loads in 75 to 85 feet in one minute.

Hauls are 400 to 1000 feet, average 800' one way. On the 400' hauls, Tournapulls are producing at costs as low as tractor scrapers, and, of course, materially beating crawler costs on the longer hauls. Output for the two Tournapulls averages 3000-yards-and-over every 10 hours according to Mr. Batson, who states that, in two months of operation, they have had only two hours down time.

tween loads, the LeTourneau Tilt-zer cleans up pit and grades.

By taking off the top 21 feet of overburden down to the rock with Tournapulls, the 1½-yard shovel can make a much wider cut. Here, a 30 to 40-foot wide cut is being worked without rehandling. In addition, these versatile Tournapulls cut pit entrances and reduce grades on coal truck haul-roads.



urnapulls travel loaded up 150' 10% grade and 250' of 6% ade on an average 800' haul.

If you have stripping problems involving rehandling, your LeTourneau distributor will be glad to help you check costs on this modern high-speed Scraper method with rubber-tired Tournapulls. See him TODAY.

CM3

LETOURNEAU
PEORIA, ILLINOIS • STOCKTON, CALIFORNIA

JOB-PROVED
Over 3200 Built and Shipped

TOURNAPULLS*

*Trade Mark Reg. U. S. Pat. Off.

with Morrow Mfg. Co. for shaking screens, loading booms, conveyors, etc.; capacity, 250 t.p.h. mine-run; to be completed about Sept. 1.

BUCKEYE COAL & LIMESTONE CO., Mine Near Pedro, Ohio—Contract closed with Morrow Mfg. Co. for feeder, screens and picking table; capacity, 75 t.p.h. mine-run; to be completed about July 1.

GATEWAY COAL CO., Forest City, Pa. —Contract closed with Deister Concentrator Co. for six SuperDuty Diagonal-Deck No. 7 washing tables to handle No. 4 buckwheat; two 4x7-ft. Leahy heavy-duty No-Blind vibrating screens to screen at $\frac{3}{16}$ in. and one six-way split Concenco revolving feed distributor to handle feed to SuperDuty tables.

Association Activities

UTAH COAL OPERATORS' ASSOCIATION elected the following officers at its annual meeting: president, Claude P. Heiner, vice president, Utah Fuel Co.; vice president, A. B. Foulger, general manager, Lion Coal Corp.; executive secretary, B. P. Manley; directors, L. E. Adams, A. P. Cederlof, A. B. Foulger, R. H. Harmer, Claude P. Heiner, Paul F. Keyser, Terry McGowan, George A. Schultz and Paul L. Shields.

MIDWEST COAL TRAFFIC BUREAU has reelected the following officers: president, G. L. Parsons, general sales manager, Apex Coal Co., Kansas City Mo.; first vice president, A. P. Rudowsky, vice president, McAlester Fuel Co., McAlester, Okla.; second vice president, A. M. Hannah, president, Mackie Clemens Fuel Co., Kansas City, Mo.; executive vice president and secretary-treasurer, H. J. Goudelock, Kansas City, Mo.; vice president and counsel, Thomas L. Philips, St. Louis, Mo.; executive committee, Messrs. Parsons, Rudowsky, Hannah, A. F. McElhenie, E. M. Douthat, W. C. Shank, W. P. Bross and Earl Wells.

OHIO COAL TRADE ASSOCIATION elected the following officers at its annual meeting: president, R. L. Ireland, Jr.; vice president, E. H. Davis; executive vice president, Ezra Van Horn; secretary-treasurer, E. H. Miller; assistant secretary-treasurer, F. H. Bohecker.

BIG SANDY-ELKHORN OPERATORS' ASSOCIATION has reelected as president Harry LaViers, president, Princess Elkhorn and South-East coal companies. Other officers renamed are: vice president, B. F. Reed, secretary-treasurer, Turner Elkhorn Mining Co.; secretary, H. S. Homan, Ashland, Ky.; treasurer, H. H. Forester, vice president, Consolidation Coal Co. Directors named include: J. E. Bowman, vice president, Utilities Elkhorn Coal Co.; J. F. Caulfield, treasurer, Elk Horn Coal Corp.; Harry B. Crane, general superintendent, Elk Horn Coal Corp.; H. K. English, vice president, Clear Branch Mining Co.; M. H. Forester; W. W. Goldsmith, receiver, Elk Horn Coal Corp.; H. J. Harper, assistant to the vice president, Koppers Coal Div.; James R. Hurt, secretary, Sandy Valley Coal Co.; Harry LaViers; A. H.

COAL MINING ISN'T WHAT IT USED TO BE!

Now, more than ever before, efficient use of labor in coal mining is absolutely necessary to profitable operation. And, never before have S-D 1-2-3 Automatic Drop Bottom cars been so completely automatic. Never before has such automatic operation been so vital to mining.

With our new Di-Dapper Jerk-out unlatching device, no manual labor whatsoever is used in dumping cars, because there just isn't anything labor can do. Cars are easily and surely dumped, automatically, and it's all done under the car. The old fashioned lever arm and its associated parts, outside the end of car, have been eliminated entirely. This change is being recognized as a major improvement.

Today, transportation of coal from mine to bin, complete discharge of coal at bin, and return of cars to mine, is one non-stop operation, with S-D 1-2-3 "Automatics", handled alone by the locomotive operator.

In addition, the S-D 1-2-3 "Automatic" lays the coal down gently, through one door opening at a time, reducing breakage to the minimum, as shown in small picture at left, top. Cars move across bin, dumping automatically, 15 to 20 cars per minute, as shown at left, center. If something happens to close down tipple, mining can go right on until bin is full, because bin may be filled to level full with S-D 1-2-3 "Automatics".

The S-D 1-2-3 "Automatic" car meets every requirement today for more efficient use of labor in mining coal, and this means lower production costs and greater profits in the end.

Let us give you the names of operators who are using them now. You need to check up on this equipment at once.

Sanford-Day Iron Works. KNOXVILLE 9, TENNESSEE

Mandt, vice president, Stephens Elkhorn Fuel Corp.; K. S. McKinney, manager, James Hatcher Land Co.; V. D. Picklesimer, general superintendent, South-East Coal Co.; W. F. Pioch, manager, North-East Coal Co.; E. R. Price, general superintendent, Inland Steel Co.; B. F. Reed; C. D. Reed, president, Turner Elkhorn Mining Co.; and G. O. Tarleton, general superintendent Consolidation Coal Co.

COLORADO & NEW MEXICO COAL OPERATORS' ASSOCIATION elected the following officers at its annual meeting, June 20, in Denver: H. E. MacDonald, president; S. M. Thompson, vice president; E. M. Oliver, second vice president; F. O. Sandstrom, secretary-treasurer. These directors were named: N. C. Anderson, W. D. Corley Jr., George B. Dick, C. R. Garrett, Claude P. Heiner, H. E. MacDonald, Douglas Millard, W. G. Moore, E. M. Oliver, L. L. Patten, W. H. Peltier, B. W. Snodgrass, S. M. Thompson, W. J. Thompson and J. van Houten.

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Coal Publications

Illinois Mineral Industry in 1943, by W. H. Voskuil and D. F. Stevens, State Geological Survey, Urbana, Ill. R. I. 101, 89 pp., 6¾x9¾ in.; paper. Price, 25c. Free to residents of State. Of all the States in the Union, Illinois ranked fourth in coal production. While coal production rose 12 percent above 1942, crude oil declined 23 percent and natural gas (sold and used as such), 32 percent. Illinois produced about 30 percent more fuel briquets in 1943 than in 1942, an important part of the production being made from deduster dust, a byproduct in the production of stoker fuel.

Minerals Yearbook, 1942, C. E. Needham, editor, U. S. Bureau of Mines,* 1574 pp., 6x9¼ in.; cloth. Price, $2.25. This yearbook was recently released after being held as confidential for some years. Number of copies is quite limited.

Minerals Yearbook 1943, C. E. Needham, editor, U. S. Bureau of Mines*, 1626 pp., 6x9¼ in.; cloth. Price, $2.50. Long held as confidential.

Analyses of Tennessee Coals (Including Georgia). U. S. Bureau of Mines*; T. P. 671; 243 pp., 5¾x9⅛ in; paper. Price, 35c. This has the usual brief introductory pages on State coal geology, mine layouts, haulage, ventilation, coal-bed characteristics, mining and loading machinery, blasting methods, preparation, output, stripping, transportation, distribution, uses and coking.

Annual Report of Research and Technologic Work on Coal, Fiscal Year 1944, U. S. Bureau of Mines. I. C. 7322, 92 pp., 8x10½ in.; paper; mimeograph. Lignite dust containing 20 percent of moisture can be ignited both by electric arcs and by the flames of detonating dynamite, but it is exploded with less ease than the dust of low-moisture high-volatile coals. A drop-bottom wire-mesh basket contain-

* Apply Superintendent of Documents, Washington 25, D. C.

ing rock dust was discharged successfully in tests by pressure waves in advance of the flame of a coal-dust explosion. Diesel oil used for powering engines underground should have less than 0.3 to 0.4 percent of sulphur. All the sulphur in the engine exhaust appears as dioxide or trioxide. Ash removal on seven coals by the Trent process was not nearly as complete as when float-and-sink methods were employed.

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Coal-Mine Fatality Rate Continues to Climb

Accidents at coal mines of the United States caused the deaths of 63 bituminous and 12 anthracite miners in April last, according to reports furnished the U. S. Bureau of Mines by State mine inspectors.

With a production of 43,350,000 net tons, the accident death rate among bituminous miners in April last was 1.45 per million tons, compared with 1.17 in the preceding month and 1.41 in April, 1944.

The anthracite fatality rate from accidents in April was 2.26, based on an output of 5,307,000 tons, against 2.49 in the preceding month and 1.15 in the fourth month a year earlier.

For the two industries combined, the accident fatality rate in April last was 1.54, compared with 1.29 in the preceding month and 1.39 in April, 1944.

Fatalities during April last, by causes and States, as well as comparable rates for the first four months of 1944 and 1945, were as follows:

U. S. COAL-MINE FATALITIES IN APRIL, BY CAUSES AND STATES

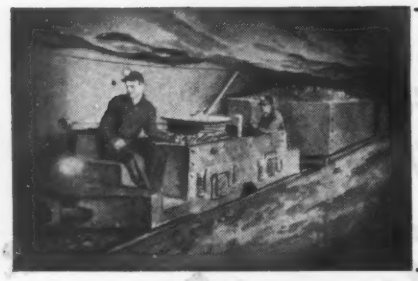
State	Underground: Falls of Roof	Falls of Face	Haulage	Explosives	Machinery	Other Causes	Total Underground	Shaft	Open-cut	Surface	Grand Total
Alabama	2	..	..	..	..	..	2	..	..	..	2
Illinois	2	..	1	..	..	..	3	1	1	1	6
Indiana	1	..	..	..	1	..	2	..	..	..	2
Kentucky	4	..	4	..	..	..	8	..	..	..	8
Maryland	1	..	..	..	..	..	1	..	..	..	1
Missouri	1	..	..	..	..	..	1	..	..	..	1
Ohio	2	..	..	..	..	..	2	..	..	..	2
Penna. (bituminous)	7	..	7	..	1	..	15	..	..	1	16
Tennessee	..	..	..	..	..	1	1	..	..	1	2
Utah	1	..	..	..	..	..	1	..	..	..	1
Virginia	5	..	2	..	..	..	7	..	..	1	8
West Virginia	6	1	4	..	1	..	12	..	..	2	14
Total bituminous	32	1	18	..	3	1	55	1	1	6	63
Penna. (anthracite)	1	1	6	1	..	2	11	..	1	..	12
Grand total	33	2	24	1	3	3	66	1	2	6	75

DEATHS AND FATALITY RATES AT U. S. COAL MINES, BY CAUSES OF ACCIDENTS*

January-April, 1944 and 1945

Cause	Bituminous: Number Killed		Bituminous: Killed per Million Tons		Anthracite: Number Killed		Anthracite: Killed per Million Tons		Total: Number Killed		Total: Killed per Million Tons	
	1944	1945	1944	1945	1944	1945	1944	1945	1944	1945	1944	1945
Underground:												
Falls of roof and coal	191	134	0.905	0.688	33	20	1.522	1.042	224	154	0.962	0.720
Haulage	77	71	.365	.365	9	9	.415	.469	86	80	.369	.374
Gas or dust explosions:												
Local	2	5	.009	.026	1	1	.046	.052	3	6	.013	.028
Major	16	16	.076	.082	..	..	....	....	16	16	.068	.075
Explosives	4	7	.019	.036	8	3	.369	.157	12	10	.052	.047
Electricity	12	4	.057	.020	..	..	....	....	12	4	.052	.018
Machinery	10	15	.047	.077	..	2	....	.104	10	17	.043	.079
Shaft	3	2	.014	.010	1	1	.046	.052	4	3	.017	.014
Miscellaneous	7	1	.033	.005	4	5	.184	.261	11	6	.047	.028
Stripping or open-cut	8	7	.038	.036	3	1	.138	.052	11	8	.047	.037
Surface	17	17	.080	.087	6	5	.277	.261	23	22	.099	.103
Total	347	279	1.643	1.432	65	47	2.997	2.450	412	326	1.769	1.523

* All figures subject to revision.



Equipment News

Arc-Welding Electrode

A new heavily covered arc-welding electrode for welding low-alloy high-tensile steels is offered by the Electric Welding Division of the General Electric Co., Schenectady, N. Y. Specially designed for use on carbon-molybdenum steel in the high-pressure piping industry, this electrode also may be applied to vessels (fittings) and structural weldments of innumerable kinds.

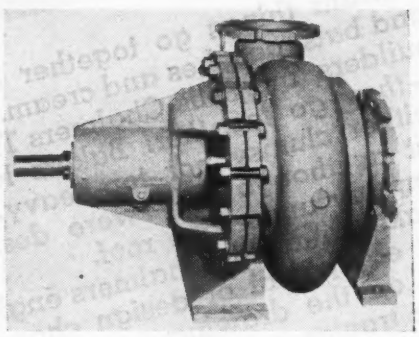
Known as Type W-56, the new electrode operates satisfactorily, it is said, on either a.c. or d.c., reverse polarity, and its range of current is sufficiently broad to cover a wide range of plate thicknesses.

A medium-long arc is recommended for best results with this electrode. It can be used in the flat, vertical and overhead positions. Moreover, it produces a relatively flat deposit, particularly in the vertical position.

Features include a stable spray-type arc, deep penetration and excellent creep-resisting qualities. In addition, the covering used produces an easily removed, light, friable slag that sets up fast, facilitating proper manipulation of the electrode. Available in sizes $\frac{1}{8}$, $\frac{5}{32}$ and $\frac{3}{16}$ in. in diameter.

Pump

Allis-Chalmers Mfg. Co., Milwaukee, Wis., offers a new Type CW pump designed for solids handling, water recirculation and sludge disposal in coal-preparation plants. Essentially a centrifugal slurry



pump, it is constructed of a tough abrasive-resistant alloy specially developed.

Simplified design of the entire unit results in few parts, requiring minimum maintenance. Removal of the entire rotating element without disturbance of suction or discharge piping illustrates quick accessibility of the parts. Stocks of complete units as well as expendable replacement parts are to be maintained in principal coal areas for 24-hour replacement service. Seven sizes have been developed to handle through 7,000 g.p.m. Complete details are given in Bulletin B6381.

Grease Fitting

Lincoln Engineering Co., St. Louis, Mo., announces the availability for civilian use of its grease fitting known as the Bullneck, designed to make necessary only one type of coupler for connecting the fittings. These fittings are machined from steel bar stock, hardened to a uniform maximum degree throughout and have a heavy zinc plating to withstand severe usage. They can be contacted by all standard type couplers.

Spout Magnet

The safety gate of a new electro-magnet for chutes manufactured by Dings Magnetic Separator Co., 509 East Smith St., Milwaukee 7, Wis., is designed to do double duty in the protection of machinery and material from tramp iron. Particles of iron are attracted to a step in the face of the double-gap high-intensity magnet so as not to be knocked off by the flow of material. When material and current are shut off, the safety gate rises automatically to discharge any accumulation of iron.

In the event of current interruption while the material is still flowing, the safety gate automatically discharges the entire burden until the flow can be shut off and current restored. Freedom from damaged machinery, explosions, fires and contaminated material is said to result.

A new Alnico spout magnet for separating tramp iron from wet or dry material from chutes also is offered. It is available in both single- and double-gap design. Iron particles catch below a step in the magnet face where they will not be knocked off by the flow of material down the chute. When the flow is stopped, the magnet opens on hinges for removal of iron. These magnets are made in both Class A and B sizes and for spout widths from 6 to 24 in. or larger when needed.

Fire Extinguishers

General Detroit Corp. announces that production is being resumed on its prewar copper-finish soda-acid and foam-type fire extinguishers. Discontinued early in the war because of material shortages, Red Star soda-acid and Floafome foam-type units will be available early in July. Descriptive literature on these extinguishers may be obtained by writing the General Detroit Corp., 2270 East Jefferson Ave., Detroit 7, or the General Pacific Corp., 1800 South Hooper St., Los Angeles 21.

Safety Glove

A new safety glove made from high-grade chrome-tanned cowhide is offered by the American Optical Co., Southbridge, Mass. Suited for welding, the new glove

also can be worn for hand protection in other heavy-duty operations. Principal feature is its one-piece back construction, leaving no seams on the back to catch sparks or molten metal. The Gunn style of manufacture reduces the number of seams to a minimum. To give added strength and protection, all vulnerable seams are welted.

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Safety Valve

What is said to be a simple, positive way to eliminate the costly and often dangerous whipping action that happens when a high-pressure air hose breaks or a connection fails is offered by the Associated Valve & Engineering Co., 510 North Dearborn St., Chicago 10, Ill. The Limit-Flo safety valve closes the line when the flow of free air exceeds a predetermined amount—it is set to allow up to the normal air flow required for tool operation.

The Limit-Flo is installed immediately ahead of the upstream end of the supply hose—no adjustments are necessary. The standard Model 1000 is designed to close when air exceeds 100 c.f.m. of free air with the supply at 85 p.s.i. It will deliver this flow through a ¾-in. hose up to 100 ft. long.

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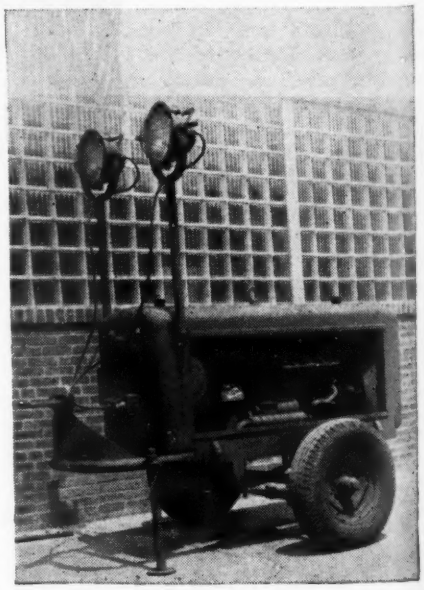
Compressor Generator

Schramm, Inc., West Chester, Pa., offers a compressor generator outfit having an actual air delivery of 60 cu. ft. and equipped with a 5-kw. generator with



adjustable floodlight that can be raised or lowered in accordance with requirements. Mounted on a two-wheel spring trailer, the outfit is completely automatic with pushbutton electric starter.

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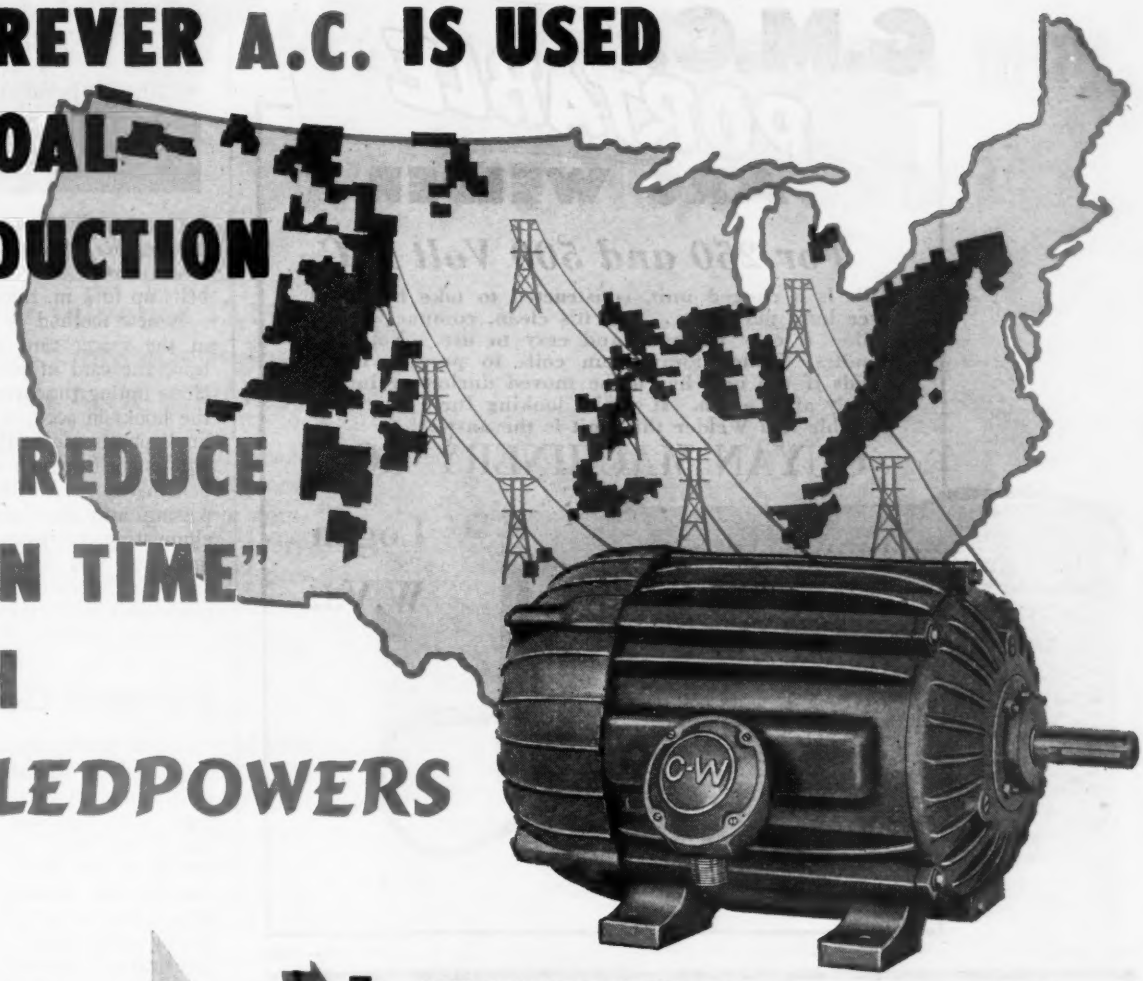
Wire Belt Hooks

Bristol Co., Mill Supply Division, Waterbury 91, Conn., has added a line of hinged-type wire belt hooks to its line of belt lacing products. They are designed

WHEREVER A.C. IS USED IN COAL PRODUCTION YOU CAN REDUCE "DOWN TIME" WITH SEALEDPOWERS



HERE'S WHY

1 The **SEALEDPOWER** Motor has a totally enclosed frame that seals out coal dust, moisture and other harmful foreign matter which would cause premature failure of insulation in a less well-protected motor. The dynamically balanced *Alucast* rotor is practically indestructible. Vacuum impregnation of windings reduces hot-spot temperatures, prevents vibration of wires and, as a result, lengthens life of windings. Obviously, with such a motor, you don't have to worry about "down time" for repairs.

2 The motor is cooled by a large fan that blows air *over the frame* instead of through easily-clogged, hard-to-clean passages as is the case in conventional fan-cooled types. Patented *Groovseal* bearings require regreasing only once a year or even less frequently. Hence, "down time" for cleaning air passages is eliminated completely, and regreasing time is reduced to a minimum.

Why not send for full information about this exclusive Crocker-Wheeler motor or for details of other general purpose a-c or d-c motors for coal mine service?

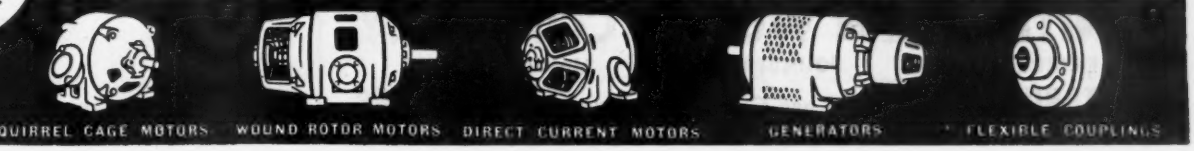
For prompt service, write or call the Crocker-Wheeler field engineering office nearest you.

CW-3

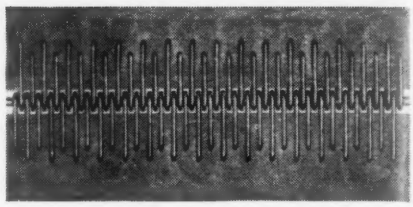
CROCKER-WHEELER

A DIVISION OF JOSHUA HENDY IRON WORKS, AMPERE, NEW JERSEY

Branch Offices: BOSTON • BUFFALO • CHICAGO • CINCINNATI • CLEVELAND • DETROIT • LOS ANGELES • NEW YORK • PHILADELPHIA • PITTSBURGH • SAN FRANCISCO • WASHINGTON



SQUIRREL CAGE MOTORS · WOUND ROTOR MOTORS · DIRECT CURRENT MOTORS · GENERATORS · FLEXIBLE COUPLINGS



for joining all types of flat belting, including leather, fabric, rubber and balata. Various sizes are offered to take care of belts up to $\frac{3}{8}$ in. thick.

A new method of mounting the hooks in the spacer card makes it possible to leave the card in place in the lacing machine during the lacing operation, holding the hooks in accurate alignment until the hook points pierce the belt. The hooks are designed in such a way as to enter the belt in two rows with each opposite point passing into the belt in alternate rows, eliminating interference between opposite hook points as they are pressed into place and also distributing the drip on the end of the belt over a greater area.

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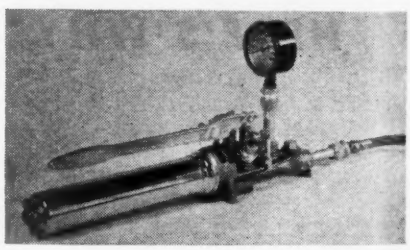
Pressure Gage Tester

A new multi-purpose pressure gage tester developed by Mansfield & Green, Cleveland, combines in a single unit a pressure gage tester that can be used with equal facility for bench testing and for portable testing in the field. On bench testing, the unit can be used with test gages or with a dead weight attachment. A simple doubly sealed check valve is said to eliminate leakage completely and loss of pressure even with grit in the system, whether using oil or water, and for pressures up to



10,000 p.s.i. Principal uses of the testing unit include testing and repairing of pressure gages and instruments, the setting up of relief or other pressure-actuated valves and general hydrostatic testing.

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Electrodes

A-C nickel manganese, A-C mo mang manganese, X2 and X3 electrodes are new additions to the arc welding electrode line of the Allis-Chalmers Mfg. Co., Milwaukee, Wis. The A-C nickel manganese and A-C mo mang manganese have wide application in the mining, cement and railroad industries for repair and rebuilding of worn equipment. Characteristics of the weld deposit allow it to work-harden, it is said, to 550 Brinell.

Hard-surfacing electrodes X2 and X3 are used to protect parts subject to extensive wear, the X2 for severe abrasion and mild impact and the X3 for severe impact and mild abrasion. A-C nickel manganese

This RUST Prevention Program may save you $10,000 too!

Manufacturer salvages 12,000 Ballistic Dies . . . protects further production with ANTI-CORRODE

A complete plant rust-prevention program is certain to insure operating economy and accelerate production. Backed by a complete line of tested Anti-Corrodes for every industry, Cities Service engineers are prepared to study *your* rust problems and recommend a specific plan to eliminate them.

Here's an Example . . .

A Bloomfield, N. J., manufacturer of ballistic dies had a costly problem. After partial completion, his dies were boxed, then shipped to another plant for final treatment. The dies invariably rusted so badly during return transit that they actually would stick together. 12,000 in this condition had accumulated in the plant, representing an investment *in labor alone* of eight to ten thousand dollars.

Cities Service engineers were called in. They supplied a product to clean the defective dies quickly . . . specified a special grade of Cities Service Anti-Corrode to protect them in storage. Three months later the dies were accepted for completion by the final processor. All dies thereafter were immediately dipped in this Anti-Corrode. The rust problem was licked.

Performance records such as this are being chalked up every day by Cities Service engineers in every industry — Mining, Textile, Metal-Working, Construction and others.

See what Cities Service can do for you. Call in our engineers now. Contact your local Cities Service office or mail this coupon.

ANNUAL RUST TOLL CONSERVATIVELY ESTIMATED AT $100,000,000 . . . All metals when exposed to the elements have an inherent tendency to revert to one or another of the forms in which they were originally found in the earth. Iron rust is the most common example of this action. Best safeguard for *your* equipment is a carefully planned and followed Rust-Prevention program.

ANTI-CORRODE safeguard for Industry

CITIES SERVICE OILS — ONCE-ALWAYS — YOUR SYMBOL OF SERVICE

Cities Service Oil Company
Room **349,** 70 Pine Street, New York 5, N. Y.

Gentlemen: Please have your engineers discuss with me a program of rust-prevention for our plant. (No obligation, of course.)

Name.....

Title..... Company.....

Address.....

City..... State.....

and A-C mo mang manganese are available in assorted sizes, both bare and coated, the coating being a combination, suitable for both a.c. and d.c. welders. X2 and X3 electrodes are available in assorted sizes with combination coating only.

•

Expansive Bit

An expansive bit, created specifically for use in hand braces to cut holes in wood, is offered by Bruno Tools, Beverly Hills, Calif. The center lip, which cuts away the ore at the center of the hole, extends back to form a clamp that firmly holds the adjustable blade at the diameter set. The clamp is locked tight by a screw. Once locked in the positive wedge-lock V groove, the cutter remains in place.

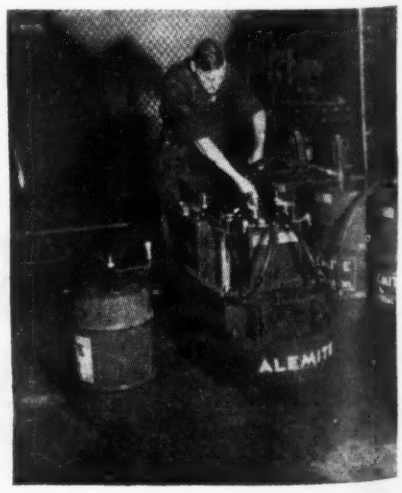
Equipped with two cutting blades—long and short—required to cover the range of the tool, a graduated scale on the blade makes adjustment easy. Another innovation, according to the manufacturer, is the removable center lip or cutter, which also serves as a clamp to hold the blade. No. 200-B, 7 in. long, cuts holes from ¾ to 1¾ in. No. 201-B, 8½ in. long, cuts all diameters from 1½ to 3½ in.

•

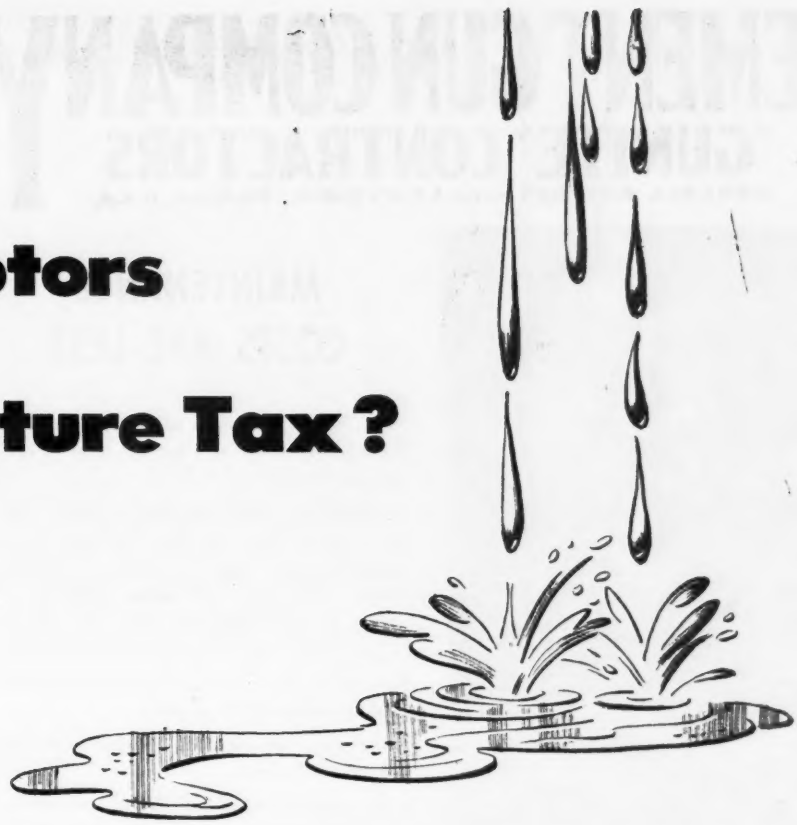
Lubrication

Designed to provide a complete, compact, portable lubrication department for industrial plants, with ability to transport and dispense a variety of grades or types of lubricants, a new Lubrikart is offered by the Alemite division of the Stewart-Warner Corp., Chicago. The new unit, mounted on 5-in. ball-bearing casters, is 21 in. wide, 31 in. long and 37½ in. high. Pushed like a perambulator, it is intended for one-man operation and is able to travel between rows of machines or elsewhere in a plant where space is limited.

It comes in two models. The basic model carries two 7-gal. tanks equipped with low-pressure pumps with 5½-ft. hose and non-drip nozzles for filling oil reservoirs on machines or hydraulic systems and for filling gear housings; one 7-gal. tank with high-pressure pump for loading hand guns; two 1¾-gal. tanks with oil transfer pumps for filling oil cans; six spout-type oil cans and four lever-type hand guns. The second model has, in addition to the fore-



Do your motors pay a Moisture Tax?



Moisture imposes heavy penalties on many motors. So do heat, dirt, overloads and the human element. Together, these operating conditions cause excessive time and dollar losses in nearly every industry.

HIGH *Safety Factor* INSULATION

Fiberglas* Electrical Insulation Materials have proved their ability to provide "extra" protection against conditions which cause most motor burnouts and failures.

Take moisture resistance, for example. The individual Fiberglas fibers do not absorb moisture. They will not swell or disintegrate or become chemically affected by oils, most corrosive vapors or acids. Therefore, Fiberglas retains its strength, supports the varnish insulating element even under adverse conditions. It is a *safety factor* which eliminates many unnecessary losses. Moisture resistance is but one of the many characteristics which make Fiberglas Insulation "High Safety Factor" Insulation.

EMERGENCY MAKES CONVINCING DEMONSTRATION

A break in the main steam line, in the boiler room of a large public utility, filled the room with live steam. Six 700 hp. induction motors were located in the room to supply air to the main boilers. It was feared that the steam and heat would knock out all of the motors. Fortunately, however, the plant engineer had previously specified Fiberglas Insulation for two of the motors, as a trial.

Of the six motors in the room, the only two which did not fail were those with Fiberglas-base Insulation. These two motors kept the generating plant in operation, at reduced capacity, until the other four could be rewound with Fiberglas.

Fiberglas-base Insulation Materials, in plain and treated forms, are available *now*. For complete information consult your distributor or write for new catalog. *Owens-Corning Fiberglas Corporation, 1862 Nicholas Building, Toledo 1, O.*

In Canada, Fiberglas Canada Ltd., Oshawa, Ontario.

ASK FOR FIBERGLAS—IN YOUR NEXT NEW MOTOR—AND ON YOUR NEXT REWIND

FIBERGLAS

ELECTRICAL INSULATION MATERIALS

*T. M. Reg. U. S. Pat. Off.

THERE'S A COMPLETE LINE OF FIBERGLAS ELECTRICAL INSULATIONS

YARNS • TAPE • CORD • SLEEVING • CLOTH AND OTHER FORMS. Also available in: Magnet wire, Lead wire, Special wires, Varnished cloth and tape; Mica combinations: Laminates, Saturated sleeving, Varnished tubing, Pressure-sensitive tapes, Special products.

going equipment, a high-pressure hand-operated grease pump that holds 30 lb. of lubricant and has a 5½-ft. lubricant hose fitted with a hydraulic coupler.

•

Fire Extinguisher

A new fast-acting portable fire extinguisher offered by American-LaFrance-Foamite Corp., Elmira, N. Y., is the Alfite Speedex, made in three different sizes—Models 15, 10 and 4—and using carbon dioxide as the extinguishing agent. The new unit is said to be engineered to extinguish more speedily small oil or electrical fires with no loss of the important extinguishing gas on anything but the fire itself.

The Speedex operating valve lever, directly above the carrying handle, can be instantly opened by the pressure of the hand grip and as quickly closed by releasing the hand pressure while the operator is maneuvering his position. For continuous operation the D-yoke ring is slipped over the operating lever while it is depressed.

•

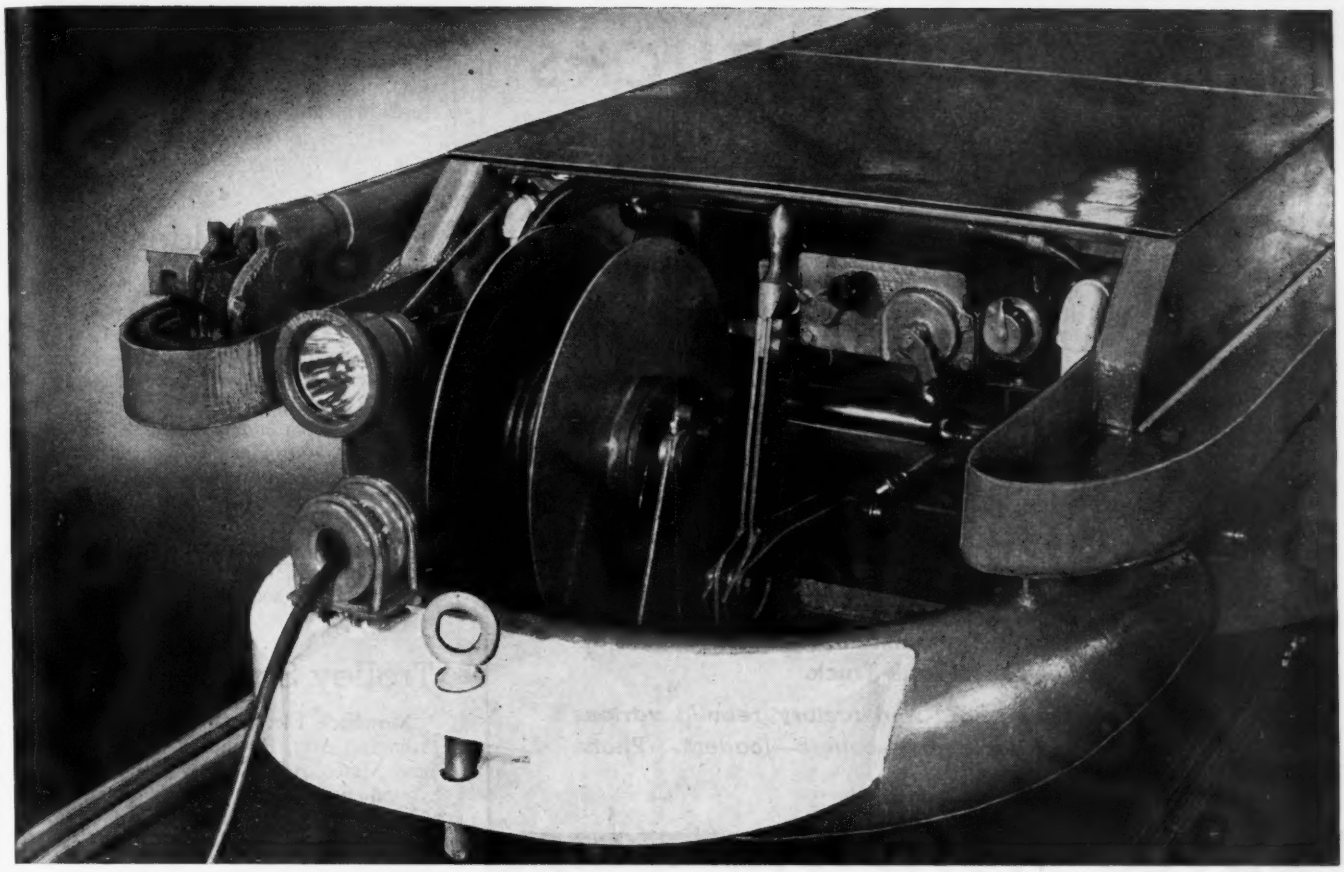
Portable Desk

A portable desk with a multiplicity of industrial uses is offered by Lyon Metal Products, Inc., Aurora, Ill. Model No. 2131-15, shown here, stands on 3-in. swivel casters and has a positive brake attachment. The over-all size is 34½ in. wide, 30 in. deep and 53 in. high (43 in. high in front). The desk hood provides adequate space for storage of working papers and has a smooth 30-in. desk top with a 3-in. over-all slope. It has a drawer 24x28x3½ in.

•

Waterproof Coating

A recently developed waterproof coating used for roofs, walls and other surfaces exposed to the elements, called Liquinoleum, is said by the manufacturer, the Continental Asbestos & Refining Corp., 1 Madison Ave., New York 10, N. Y., to have about eight times the protective thickness of paint; to be resilient, elastic and highly resistant to extremes of temperature. Even after long exposure, it



Shown above is a close-up of the control end of the Cantrell Type S-P, Compressor.

PERHAPS THIS TWO-TON LOCOMOTIVE IS JUST WHAT YOU NEED FOR THOSE QUICK JOBS!

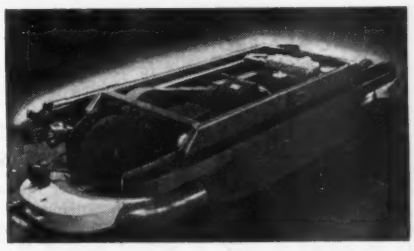
In most every coal mine a light locomotive can be used for numerous jobs and to great advantage on every shift. A two-ton locomotive is what you get when you install the Cantrell, Type S-P, Air Compressor.

Air Compressor service is essential to every coal mine, but when you get the Cantrell "S-P", you get more than a dependable air compressor, for the Cantrell "S-P" is a completely independent, self-propelling machine. It takes you to the job, gets its work done and brings you back again. Upon arrival at job power is instantly shifted to compressor as simply as shifting gears in an automobile.

Dependable Compressor service, of course, is a major function of the Cantrell "S-P". But its self-propelling feature has made it of far greater service to mines. Experience has proved that you seldom find one of these machines idle because of so many jobs it can do. For example, the Cantrell "S-P" is being used for hauling men and repairs, ditch lining, leveling haulways, shifting pumps and machines, chipping, riveting, blowing substations and dozens of other jobs.

For economy and service no other machine can touch the Cantrell "S-P". Write for complete details now. Imperial Bronze Manufacturing Co., Jellico, Tennessee, U. S. A.

The Cantrell S-P Compressor complete with safety top, and below—



—with safety top removed.

Cantrell COMPRESSORS

is stated, it will not crack, blister or alligator; is unaffected by acid fumes or the effects of most chemicals; does not crystallize on setting; even flame from a blow torch will not cause it to catch fire, flow or run. It is readily applied to any surface with brush or trowel.

•

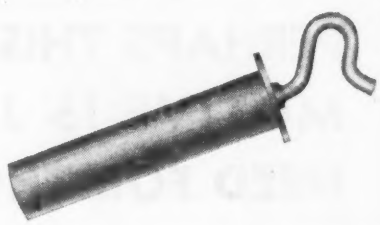
Electrode Holder

A new screw-type electrode holder, one-third lighter than corresponding size clamp-type holder, is offered by the Allis-Chalmers Mfg. Co., Milwaukee, Wis. Exposed metal surfaces are constructed of spatter-resistant Mallory metal. Simplified design facilitates easy replacement of parts, and heavy insulation and adequate ventilation provide cool operation. Available in light- and heavy-duty sizes to accommodate electrodes up to 3/8-in. diameter, the new holder has already proved its properties of longer life and ease of operation in A-C welding shops, according to the company.

•

Trolley Safety Tap

Mosebach Electric & Supply Co., 1150 Arlington Ave., Pittsburgh 3, Pa., offers a new Mesco trolley safety tap for underground use and for which patents are pending. This tap can be used to operate any type of portable equipment beyond the trolley line.



The assembly consists of a copper hook attached to a bronze fuse receptacle and a similar fuse receptacle at the opposite end of the barrel for attaching to cable connector. These assemblies are surrounded by an insulated tubular housing with fiber guard at hook end to protect against trolley wire.

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Industrial Notes

Hood Refining Co., Greensburg, Pa., has appointed the following distributors of Gibraltar oil products: Kelly Oil Co., Greensboro, N. C.; Big Boys Auto Parts Co., Sunbury, Pa.; Gregory Oil Co., Goldsboro, N. C.; New Kensington Auto Parts Co., New Kensington, Pa., and Parks & Hull Automotive Corp., Baltimore, Md.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has made these changes in the sales organization of its Tractor Division: Marshal L. Noel, previously industrial sales manager and long identified with the company's crawler tractor and road machinery sales, has been appointed general sales manager of the Tractor Division; William J. Faulkner, formerly manager of the Tractor Division's Washington (D. C.) office, becomes industrial sales manager. Assistant industrial sales man-

Preformed wire rope

SAVES REPLACEMENT 3 WAYS

Since preformed wire rope lasts longer, obviously it reduces frequency of replacing the rope itself. Not quite so obvious, but equally important, is the ease with which preformed wire rope adjusts itself to different uses. Because of its ready adaptability—its resistance to rotating in sheave grooves and its better spooling qualities—preformed postpones the replacement of machine parts or shut-downs for repairing. A third way in which preformed wire rope saves replacement is with the men on the job. As preformed rope is safer to handle it reduces lost-time accidents. Make certain your next wire rope is preformed.

ASK YOUR OWN WIRE ROPE MANUFACTURER OR DISTRIBUTOR

agers are F. B. Harrison, formerly territory sales manager, and E. G. Kullmann. Newly appointed agricultural sales manager is H. A. Gratner, previously northwest territory sales manager. Louis Adams has been appointed harvester line sales manager, which includes all products manufactured at the company's LaPorte works. S. H. Sorenson will be assistant harvester line sales manager. Ernest Franks has been placed in charge of wheel tractor sales for industrial purposes, in addition to his former duties as manager of power unit sales. Boyd S. Oberlink, until recently an assistant industrial sales manager, has been appointed assistant to the vice president, Tractor Division.

OLIVER UNITED FILTERS, INC., New York, Chicago and Oakland, Calif., has appointed Leon D. Thompson as export sales manager, with headquarters at 33 West 42d St., New York 18. He has been with the company as a technical filtration engineer for more than 25 years.

WORTHINGTON PUMP & MACHINERY CORP. has named Herman J. Schorle as works manager of the Holyoke Works. He succeeds Harry A. Feldbush, who has assumed administrative duties at the general offices in Harrison, N. J. Mr. Schorle formerly was executive engineer at Holyoke and assistant works manager. Assisting him is Willard A. Emery, former superintendent of all welding operations.

WHITING STOKER SALES CO., 11 South LaSalle St., Chicago 11, has added Lloyd W. Hemingway to its engineering development staff.

HEWITT RUBBER CO., 80 First Ave., Pittsburgh 22, Pa., has appointed Elliott S. Williams as sales and service representative, working in the Pittsburgh district. He formerly was with the Goodall Rubber Co.

PETTIBONE MULLIKEN CORP., Chicago, announces that John Gronlund has joined the organization as director of sales in its construction equipment division. He formerly was connected with the LaPlant-Choate Co. and the Buckeye-Traction Ditcher Co.

WILSON WELDER & METALS CO., INC., New York, has appointed the Graybar Electric Co. as exclusive distributor of Wilson electrodes in the areas served by Graybar's Cincinnati, Pittsburgh and Cleveland offices.

AMERICAN OPTICAL CO., Scientific Instrument Division, Buffalo, N. Y., hereafter will be the name of the Spencer Lens Co. A booklet, "Three American Microscope Makers," tells the story of the early days in American scientific instrument manufacture.

CUTLER-HAMMER CO., INC., Milwaukee, has named F. R. Bacon as chairman of the board, a position he held from 1924 to 1931; H. F. Vogt, chairman of the executive committee; G. S. Crane, president; H. F. Vogt, vice president and treasurer; J. C. Wilson, vice president and secretary; P. B. Harwood, vice president in charge of engineering; P. S. Jones, vice

president in charge of sales; Philip Ryan, vice president in charge of manufacturing; E. W. Seeger, vice president in charge of development and assistant secretary; M. R. Fenno, assistant treasurer; J. C. Springer, assistant secretary.

E. I. DUPONT DENEMOURS & CO., INC., Wilmington, Del., has appointed D. J. Sullivan as assistant plant manager at the Fairfield (Conn.) plant of the fabrics division and has transferred Dr. G. T. Vaala from the chemical department, experimental station, Wilmington, to Fairfield as assistant director of the laboratory.

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Trade Literature

RUBBER PRODUCTS—Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc., Passaic, N. J. Fifth edition of "Manhattan Rubber Products for Industry," condensed catalog of mechanical rubber goods, describes many mechanical rubber products and special items. Particular emphasis is given transmission and conveyor belting, V-belts, hose, packing, molded rubber products, rubber roll coverings, tank linings and abrasive wheels.

OFF-HIGHWAY TIRES—B. F. Goodrich Co., Akron, Ohio. Booklet on "How to Get the Most Service Out of Your Off-the-Road Tires" describes, with text and pictures, each of the off-the-road lines of tires the company manufactures for specific services. Reasons for particular constructions to meet exacting requirements are explained. Hazards which meet each type of tire are pointed out and methods to avoid them suggested.

PORTABLE ELECTRIC VULCANIZERS—B. F. Goodrich Co., Akron, Ohio. Catalog Sec. 2158 describes the special construction features of each of the portable belt vulcanizers in its line, giving service conditions under which each type operates in detail and containing a table giving complete dimensions on each vulcanizer, number and dimensions of platens, widest belt that can be spliced on it and wattage consumed.

LUBRICATION—Fiske Brothers Refining Co., Newark 3, N. J. Handbook cites as features of Lubriplate that it creates and maintains a minute, wear-resisting, load-bearing film on all contacting moving machine parts that reduces friction, wear and power consumption besides protecting them against rust and corrosion.

ARC WELDING—General Electric Co., Schenectady, N. Y. Bulletin GEA-3329 tells how to repair tractor parts by arc welding, which is said to make them last 20 to 100 percent longer than new parts, it being stated that the deposited weld metal is harder and more wear-resistant than the original.

ELECTRODES—Air Reduction, 60 East 42d St., New York 17. Catalog covers entire line of Airco electrodes for welding mild steel, alloy steels, stainless steels, galvanized sheet steel, aluminum and other non-ferrous metals and for hard-facing, with complete descriptions and details of

Lowest COST PER TON WITH REPUBLIC CONVEYOR BELTS

ON CONVEYORS in the coal industry, Republic belts will achieve records for long service life and lowest cost per ton. Through technological advances in synthetic rubbers, this heavy duty belting has been recently improved—it is now "better than before." Record Maker-S and Super Excelo Reprene are quality belts engineered for this service, differing in synthetic compounds and resultant service characteristics. Super Excelo Reprene is constructed with oil-and-heat-resisting rubber and is recommended for its bonding against ply separation and additional resistance to abrasion, wear, tear, and fatigue. Ask your Republic Distributor about improved Republic Conveyor Belts.

REPUBLIC RUBBER

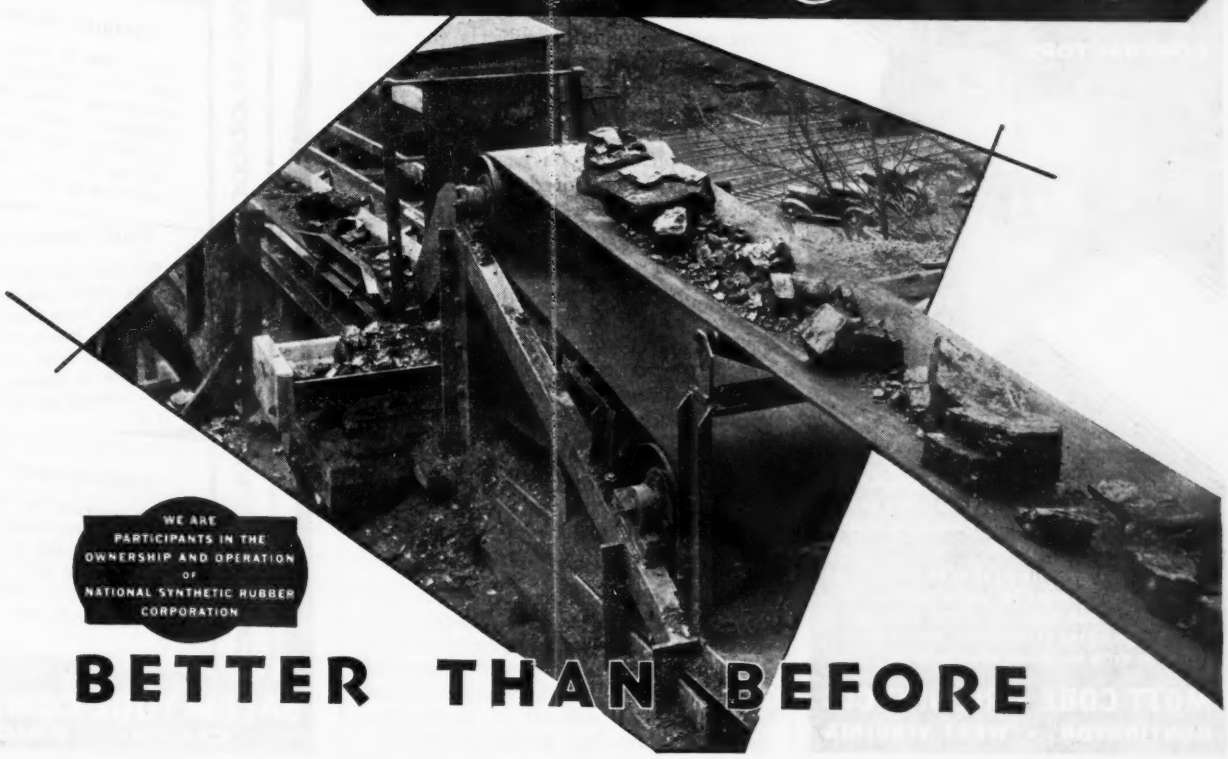
DIVISION

LEE RUBBER & TIRE CORPORATION

YOUNGSTOWN 1, OHIO

REPUBLIC INDUSTRIAL PRODUCTS
YOUNGSTOWN, O.

LEE DELUXE TIRES AND TUBES
CONSHOHOCKEN, PA.



WE ARE PARTICIPANTS IN THE OWNERSHIP AND OPERATION OF NATIONAL SYNTHETIC RUBBER CORPORATION

BETTER THAN BEFORE

applications, welding procedure, mechanical properties, chemical analyses and specifications. Various types of fillet welds made with many of the electrodes cataloged also are illustrated and a combined electrode selector chart and index, illustrated sections on mechanical properties and testing and on approvals.

TRUCK LEASING—National Truck Leasing System, 540 North Michigan Ave., Chicago 11. Bulletin cites the advantage of truck leasing and describes the system's service.

STEELS—Republic Steel Corp., Cleveland, Ohio. Folder Form 434, on low-alloy, high-tensile steels, gives general characteristics, chemical composition and physical properties of Republic Aldecor, Cor-Ten and double-strength steels. These three steels are said to be especially well qualified for the construction, in modern lightweight design, of mobile structures used in transportation, such as railroad and mine cars, trucks and truck bodies, trailers and similar applications.

PULLEYS—Dings Magnetic Separator Co., 509 East Smith St., Milwaukee, Wis. Catalog describes in detail the uses of magnetic pulleys in a variety of industries; tells how to select a magnetic pulley; and includes tables, capacities, dimensions, etc. Specifications of air-cooled magnetic pulleys are fully covered and installation pictures are liberally used.

HARD-FACING—Mir-O-Col Alloy Co., 2416-60 East 53d St., Los Angeles 11, Calif. "Weldors Guide to Successful Hard-Facing" tells what hard-facing is, its uses, metals to which it can be applied and its purposes and advantages.

BALL BEARINGS—New Departure Division General Motors Corp., Bristol, Conn. Part I of a series of treatises on the fundamentals of ball bearings, entitled "Bearing Application," contains 78 drawings and charts with a clear and orderly description, covering among other subjects the most important fundamentals of bearing mounting applicable to all types, preloading methods, their effects on housing fits, the effect of press fits on preloading, the effect of preloading on bearing life, bearing creep, the use of duplex, shield and sealed bearings, etc.

LUBRICATION—Reliance Electric & Engineering Co., Cleveland. Instruction sheet (No. 3042) covers the grease lubrication of anti-friction bearings in Reliance a.c. and d.c. motors, v.s. drives and m.g. sets. It details construction, maintenance and lubrication recommendations for double-shielded ball, open ball and spherical roller-bearing types.

BIT TIPS—Stoody Co., Whittier, Calif. Folder tells how to keep bits sharp with Borod, explaining how it is applied and the economy of its application.

LUBRICATION—Standard Oil Co. (Indiana), Chicago. Technical Bulletin 45-1 gives the history of the development of Stanolube HD, an improved heavy-duty motor oil said to be able to tackle successfully the most difficult of automotive, diesel and heavy-duty lubrication.

TIME RECORDER—Bristol Co., Waterbury, Conn. Bulletin OP1502 describes newly developed machine running-time recorder. Typical chart records are illustrated.

CABLE CHART—R. G. LeTourneau, Inc., Peoria, Ill. Wall chart, Form N-104, 17x22 in., gives cable requirements for all LeTourneau equipment. It stresses the service angle and gives practical tips on how to get longer service from wire rope.

MAGNETIC SEPARATORS—Eriez Mfg. Co., Erie, Pa. Bulletin 102-A cites eight outstanding advantages of Eriez non-electric permanent magnetic separators in removing tramp iron from any non-metallic material, including coal.

GOGGLE STATION AND SPRAY—Allen Optical Co., Buffalo, N. Y. Bulletin tells what Allen Sani-Spray does and describes the all-metal goggle station designed especially for applying it.

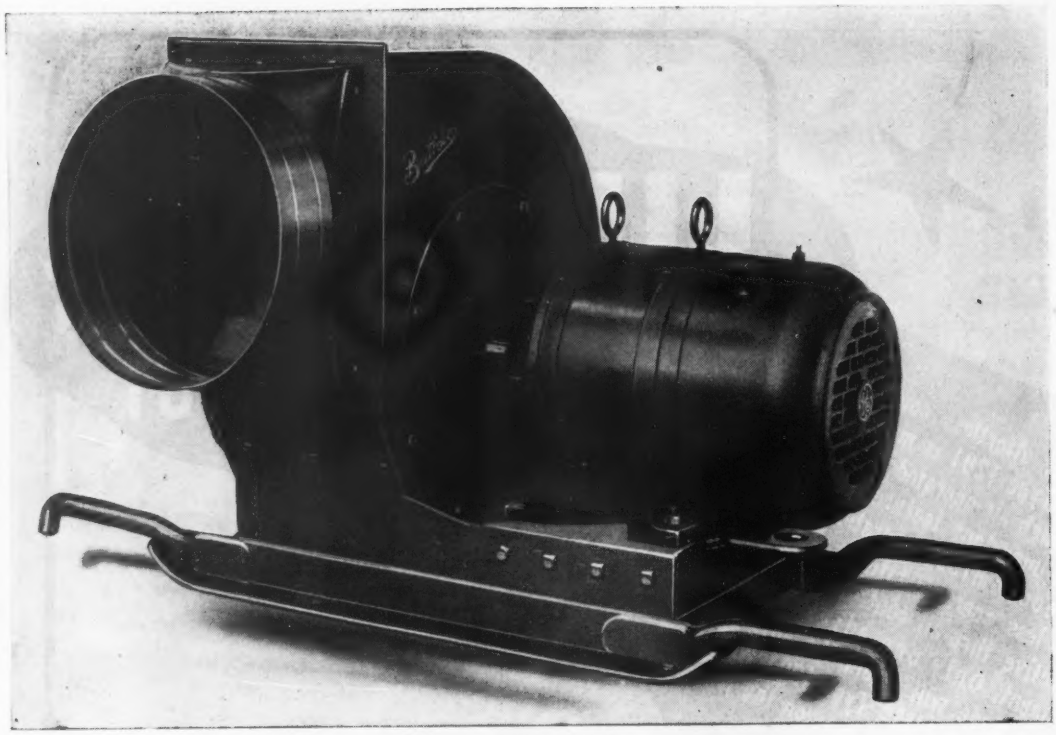
MOLDED FABRIC BEARINGS — Gatke Corp., 228 North LaSalle St., Chicago 1. Brochure lists unusual performance qualities of Gatke molded fabric bearings and describes advantages in meeting difficult and unusual service conditions. Lists performance reports showing results under widely varying service conditions and illustrates numerous types and sizes in which Gatke bearings are being molded to required dimensions for installation without machining.

INDUSTRIAL RUBBER PRODUCTS—Goodyear Tire & Rubber Co., Akron, Ohio. Catalog gives product information and construction details on all Goodyear standard line industrial rubber products. Quick facts are given about synthetic rubber constructions.

TRACTOR—Caterpillar Tractor Co., Peoria, Ill. Catalog Form 8869 decribes the Caterpillar diesel D8 tractor, emphasizing power, effective and efficient use of that power and construction that will do the job with a minimum of time out for repairs. Features of the 113 drawbar horsepower unit and the diesel engine that motivates it are shown, along with views in action on many jobs.

CENTRIFUGAL PUMPS—Denning Co., Salem, Ohio. Booklet contains basic information about various standard types of centrifugal pumps, pointing out that most so-called "pump failures" are due to misapplications caused by unfamiliarity with one or more basic facts about the pumps themselves. To assist those directly involved in the application and selection of centrifugal pumps of all standard types is its purpose.

INDUSTRIAL PACKINGS—Greene, Tweed & Co., Bronx Blvd. at 238th St., New York 66, N. Y. Bulletin P-3, intended as a guide in selecting the most suitable packing for specific fluids, equipment and types of service, gives condensed descriptions of each grade of Palmetto packing, telling their leading features and purposes, with illustrations.

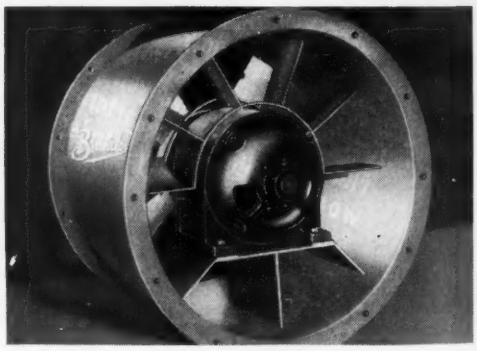


HUSKY
for HARD SERVICE

● These Portable Mine Ventilating Units are not standard "Buffalo" fans equipped with skids. They have special heavy-duty construction to withstand the bumps and jolts of underground service. High efficiency means more air per power-dollar. Non-overloading characteristic prevents burning out motor regardless of whether you have 10 feet or 1000 feet of tubing on the discharge.

Bulletin 3024-C gives dimensions and complete details including price. Write for it.

BUFFALO FORGE COMPANY
147 Mortimer Street **Buffalo, N. Y.**
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

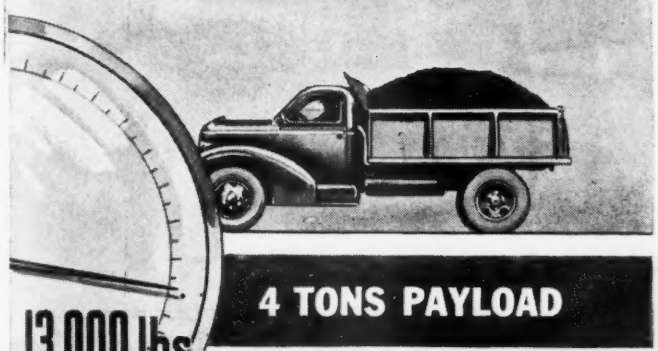


Buffalo Axial Flow Fans are made in a wide range of sizes, from 12" up. They deliver air in a true axial flow, reducing turbulence and wasted energy. Suitable for above ground or as booster units below ground, they may be direct or belt-driven. Write for Axial Flow Bulletin 3533.

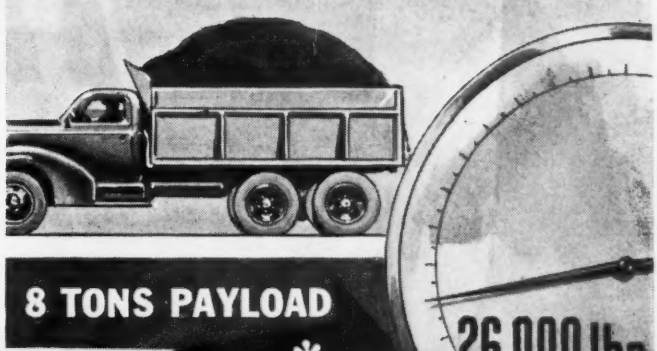
"Buffalo" "First For Fans"

PORTABLE VENTILATING UNITS

Same Driver...Same Truck....



4 TONS PAYLOAD



8 TONS PAYLOAD

100% more payload!*

A THORNTON Four-Rear-Wheel DRIVE installed on your present 1½-2 ton truck will increase its hauling ability 100% . . . give it 8 ton payload capacity in contrast to its normal 4. With a Thornton conversion, one driver can handle the payloads of two medium trucks. Special axles permit still bigger payloads. You, therefore, double your trucking volume without necessity for hiring another driver or buying another truck.

And that's not all a THORNTON Four-Rear-Wheel DRIVE does for you. Its two-speed gear case and two driving axles, working in combination with the standard truck transmission, enables you to pull 26,000 pounds G.V.W. up grades as steep as 50%. Its 8 to 16 speeds forward, depending upon the axle type, give you power for every operating condition—let you haul 8 tons payload through mud, muck, deep sand or snow, out of steeply inclined gravel pits or quarries—every place, in fact, where the conventional single axle truck would be hopelessly stalled. And with all this power, a THORNTON Four-Rear-Wheel DRIVE lets you roll on the highway at 40-50 miles per hour, to maintain important delivery schedules.

The THORNTON Four-Rear-Wheel DRIVE is available *without priority or ration release.* COMES COMPLETE WITH 8 NEW TIRES. **Mail the coupon today for full descriptive data and performance details.**

* **IDEAL FOR: Logging • Mining • Lumbering • Oil Production • Limestone Spreading • Sand and Gravel Hauling • Dump Truck Work • General Hauling • Road Maintenance • Street Flushing • Gas and Oil Transport • Ready Mix Concrete • Coal Hauling • Bulk Milk Hauling**

The ODT, recognizing the importance of the THORNTON *Four-Rear-Wheel* DRIVE, allots 8 new tires with each Thornton unit. You get them for your truck when the unit is installed.

QUICK FACTS!

Carries 100% more payload.

Out-pulls, outlasts, out-maneuvers standard trucks costing double or more.

Two-speed gear case increases tractive effort or rim-pull more than 100% over standard truck.

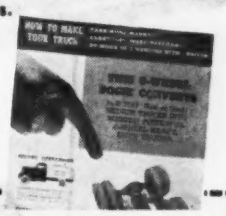
Owners report saving up to 40% on investment . . . 30% on operating costs . . . 35% on upkeep expense.

Provides better flexibility and load flotation.

Six wheel brakes assure greater driving safety.

Saves on tires . . . gasoline . . . oil . . . wages and time.

The heart of the THORNTON DRIVE is the exclusive THORNTON Automatic-Locking DIFFERENTIAL which gives both axles POSITIVE DRIVE and DIFFERENTIAL ACTION without "axle fight." Available as replacement in many standard trucks. Write for details.



FREE: *Mail the coupon for descriptive folders and full details about the* **Thornton** *Four-Rear-Wheel* **Drive.**

EVERY

THORNTON 4-Rear-Wheel DRIVE

INCORPORATES A

THORNTON Locking DIFFERENTIAL

ALSO AVAILABLE FOR TRUCK AXLES

Thornton Tandem Co.

8701 Grinnell Avenue, Dept. 48, Detroit 13, Michigan, U.S.A.

Please send me catalog of facts on changing my 1½-2 ton truck into a heavy duty truck.

Name _____

Address _____

City _____ **State** _____

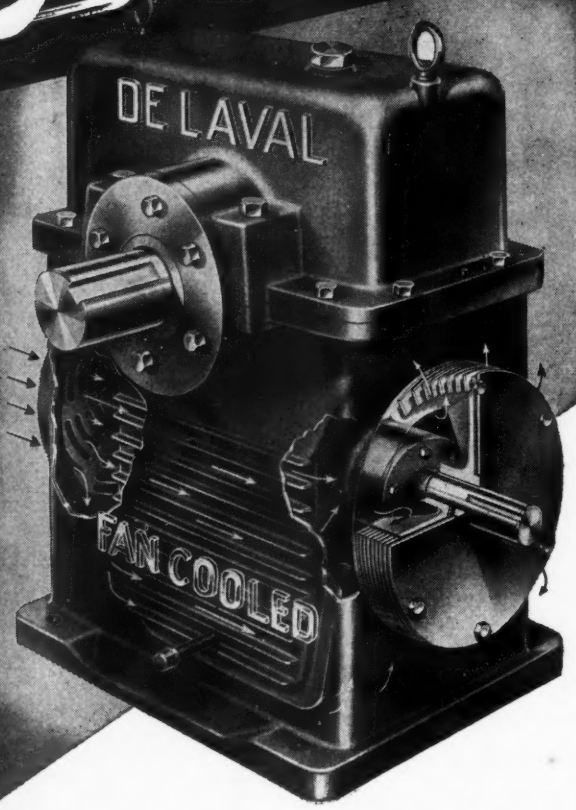
Make of Truck _____ **Year** _____

Used for _____

SOON AVAILABLE

NEW FAN-COOLED

DE LAVAL WORM GEAR



HIGHER CAPACITY

Capacity is approximately doubled for all ratios at 1750 r.p.m. as compared with standard heavy duty units of the same frame size.

LOWER COST PER HORSEPOWER

Operation at higher ratings permits the use of correspondingly smaller and less costly units.

SMALLER SIZE

Reduction of as much as two frame sizes in some instances. The use of smaller, lighter units results in a saving both of floor space and of critical materials needed for the war effort.

The *NEW* DE LAVAL *FAN-COOLED* WORM GEAR SPEED REDUCER

will soon be available in a complete line of sizes. Send for literature now being prepared.

1149

TURBINES • HELICAL GEARS and WORM GEAR SPEED REDUCERS • CENTRIFUGAL PUMPS • CENTRIFUGAL BLOWERS and COMPRESSORS • IMO OIL PUMPS

WORM GEAR DIVISION

DE LAVAL

STEAM TURBINE COMPANY · TRENTON 2, NEW JERSEY

SALES OFFICES: ATLANTA · BOSTON · CHARLOTTE · CHICAGO · CLEVELAND · DENVER · DETROIT · DULUTH · EDMONTON · GREAT FALLS · HAVANA · HELENA · HOUSTON · KANSAS CITY · LOS ANGELES · MONTREAL · NEW ORLEANS · NEW YORK · PHILADELPHIA · PITTSBURGH · ROCHESTER · ST. PAUL · SALT LAKE CITY · SAN FRANCISCO · SEATTLE · TORONTO · TULSA · VANCOUVER · WASHINGTON, D. C. · WINNIPEG

DESIGNS, TOOLING AND PRODUCTION ECONOMIES

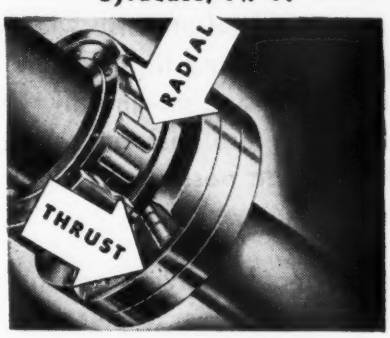
Ready-made for

THRUST APPLICATIONS

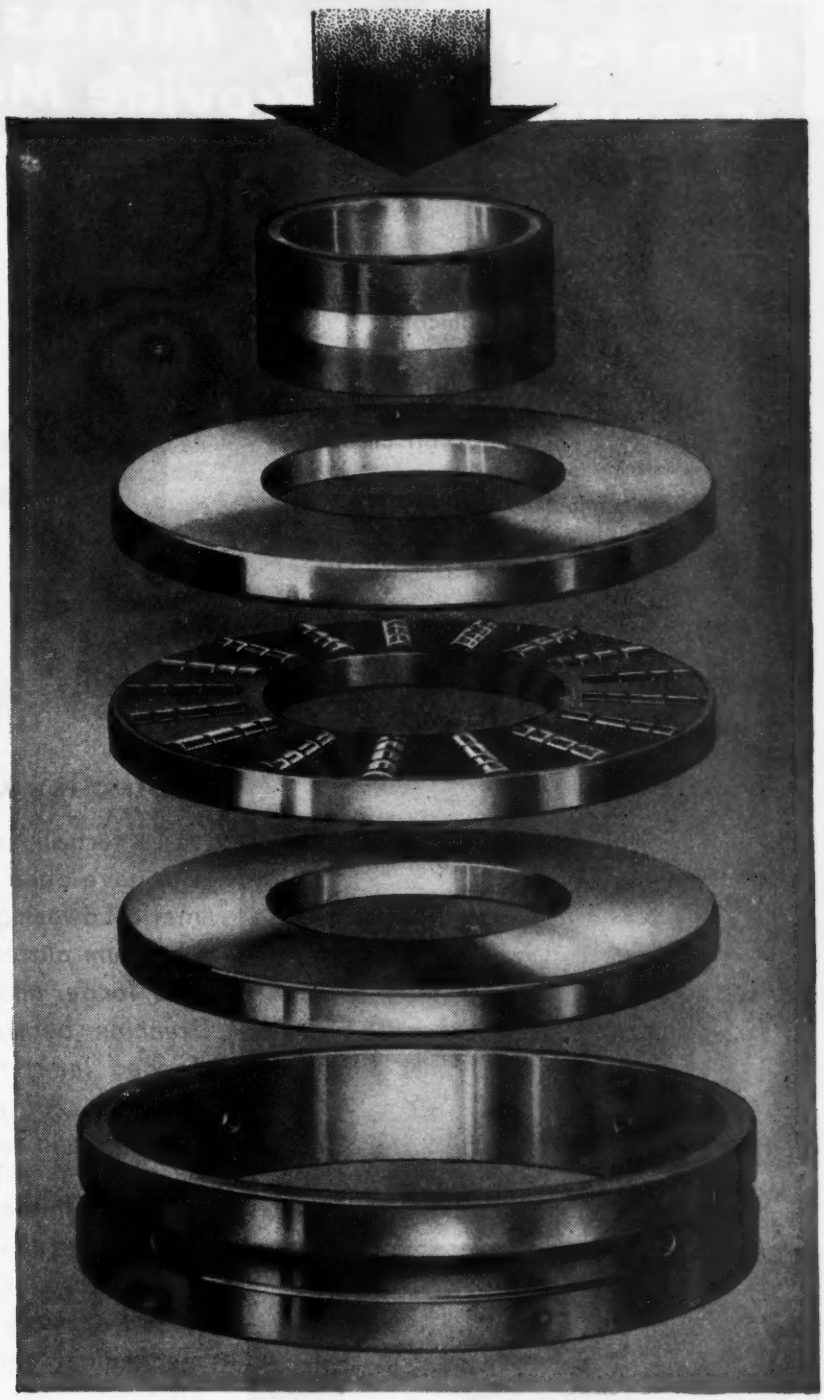
Rollway roller thrust bearings offer the widest selection in types and sizes. All the preliminary designs, tooling and production methods have been set up—assuring low cost and quick delivery for most applications.

Thrust loads are carried at right angles to the axes of solid cylindrical rollers. Rollers that are shortened to provide true rolling, and staggered to equalize distribution of wear. There are no diagonal resultants, no piling up of radial and thrust loads on the same bearing assembly. That's why you can carry heavier continuous, intermittent or reversing loads over longer periods of life expectancy—even under severe shock or vibration. Where compound loads are encountered, separate radial bearings carry the radial component, also at right angles to the roller axes.

ROLLWAY BEARING COMPANY, INC.
Syracuse, N. Y.



For compound loads SEPARATE radial and thrust bearings are used in combination as per diagram.



Simplified Double Acting — Type SDT

Select Bearings for the Job They Do

Size of shaft, limiting features of the application, loads, speeds and the duties required of the machine, all have an influence on the type and size of bearing you should use. Our engineering specialists will gladly make necessary calculations, drawings and supply the information required for a complete understanding of the problem. No charge or obligation.

ROLLWAY CYLINDRICAL ROLLER BEARINGS

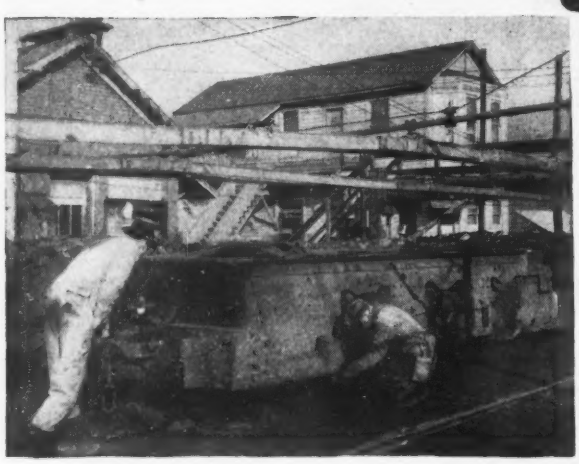
SALES OFFICES: Philadelphia • Boston • Pittsburgh • Youngstown • Cleveland • Detroit • Chicago • St. Paul • Houston • Tulsa • Los Angeles

Preferred by Mines Everywhere Because They Provide Maximum Safety!

A size for seams of any thickness

84A, 14" high, 7" lift
85A, 17" high, 10" lift
86A, 20" high, 13" lift
5-tons capacity. Toe lift on all sizes.

Lift from a minimum height of 1¾". Other Simplex Automatic Lowering Jacks in 10, 15 and 20-ton capacities.



Cars and light locomotives are quickly re-railed with Simplex Jacks.

Moving a coal cutter with a Simplex No. 85A Jack.

Simplex General Purpose Mine Jacks

To furnish added safety, the following characteristics have been embodied in Simplex "A" Series Automatic Lowering Jacks: *double lever sockets, stronger cadmium plated springs and links, shorter fulcrum centers, longer and wider concave rack bar toe lifts, larger trunnion bearings, larger and stronger pawls, reinforced inner-ribbed housings, and greater inbuilt strength. All parts are interchangeable except the housings and rack bars.*

These Simplex Jacks are invaluable for use with coal cutting and loading machines and are also widely employed for re-railing mine cars and light locomotives, mine trackwork and for lifting and moving all types of mechanical equipment. They are fast operating and efficient. Light weight is made possible by the use of high strength alloy steels.

Profit through time saving by having one of these Simplex Jacks on every coal cutter, loader and locomotive.

TEMPLETON, KENLY & CO.,
CHICAGO (44), ILLINOIS

Better, Safer Jacks Since 1899

Simplex
LEVER · SCREW · HYDRAULIC
Jacks

NOT YET—

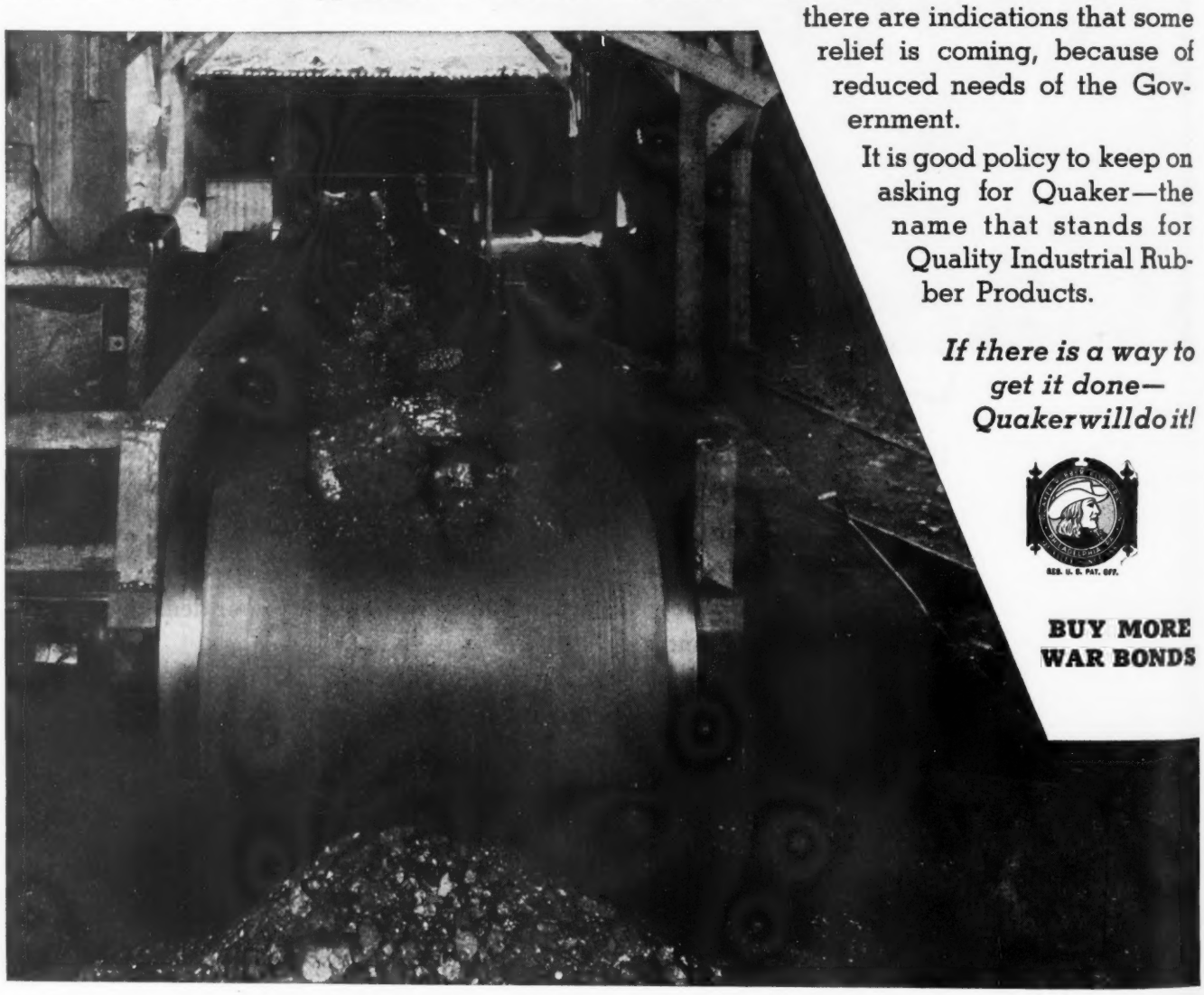
but definitely coming!

All the Industrial Rubber Goods you want. Big massive conveyor belts; hose of every description; tubings; rod and sheet packings; moulded articles—just the type of products needed to keep industry humming.

Right now this seems too good to be true. There are, however, indications that point to considerable more production being available for civilian needs.

Quaker is looking forward to the time when we can again give that type of service to our thousands of accounts to whom speed and promptness mean so much.

Quaker, along with other rubber manufacturers, have been doing a magnificent job to keep vital rubber products supplied to the vast war machine. It has been a tremendous job, and there are indications that some relief is coming, because of reduced needs of the Government.



It is good policy to keep on asking for Quaker—the name that stands for Quality Industrial Rubber Products.

If there is a way to get it done—Quaker will do it!

REG. U. S. PAT. OFF.

BUY MORE WAR BONDS

QUAKER RUBBER CORPORATION

Manufacturers INDUSTRIAL RUBBER PRODUCTS

PHILADELPHIA 24, PA. • NEW YORK 7 • CLEVELAND 15 • CHICAGO 16 • HOUSTON 1

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QUAKER PACIFIC RUBBER COMPANY • SAN FRANCISCO 5 • LOS ANGELES 21

What single fact makes BOWDIL your best choice for coal cutting?

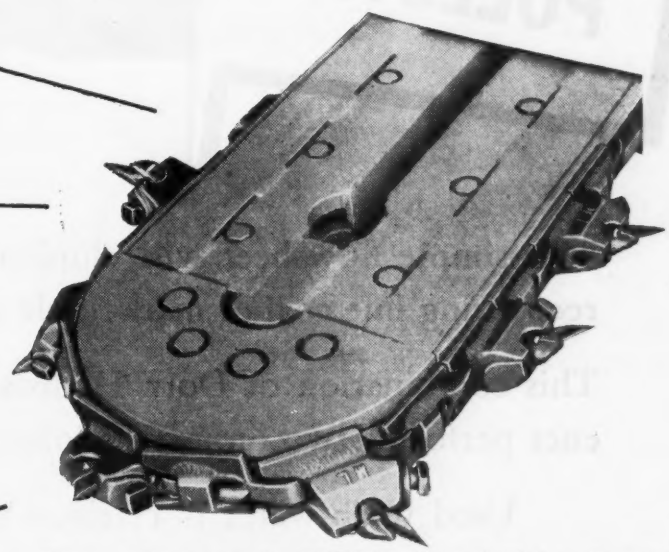
It's *workmanship* . . . in materials . . . in design . . . and in construction of BOWDIL coal cutting equipment that makes the difference! The difference of course, is in greater amounts of coal cut per shift, in reduced power requirements and in fewer replacements and repairs. Illustrated below is the BOWDIL Cutter Bar. Look it over—weigh its advantages (they're numerous!) and you'll agree that BOWDIL is your best choice for the finest in coal cutting equipment.

The BOWDIL Cutter Bar is thin, compact . . . cuts a thinner kerf and eliminates "bug dust" cuttings. Z-bar construction insures rigidity for sumping in and arcing cuts.

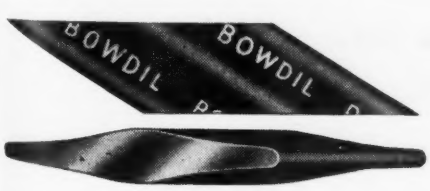
The BOWDIL Cutter Chain won't kink—is designed to distribute strain—features large connections that *hold*. Body sections are rugged, drop-forged.

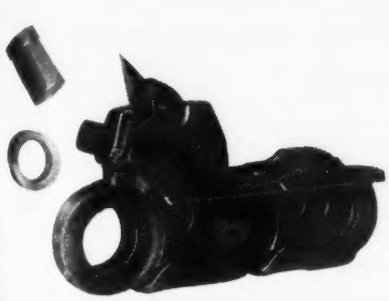
BOWDIL Cutter Bits are concave, provide greater clearance, insure coarse cuttings. The concave design permits wearing them down 25% farther than standard bits.

Used in combination, the BOWDIL Bar, Chain and Bit have shown, in actual test, savings of 30% to 45% in time and power over conventional bits.



Here, a close-up of the BOWDIL Bit and Chain. Note the concave design of the bit for coarse cutting and the sturdy construction of the chain and connections.



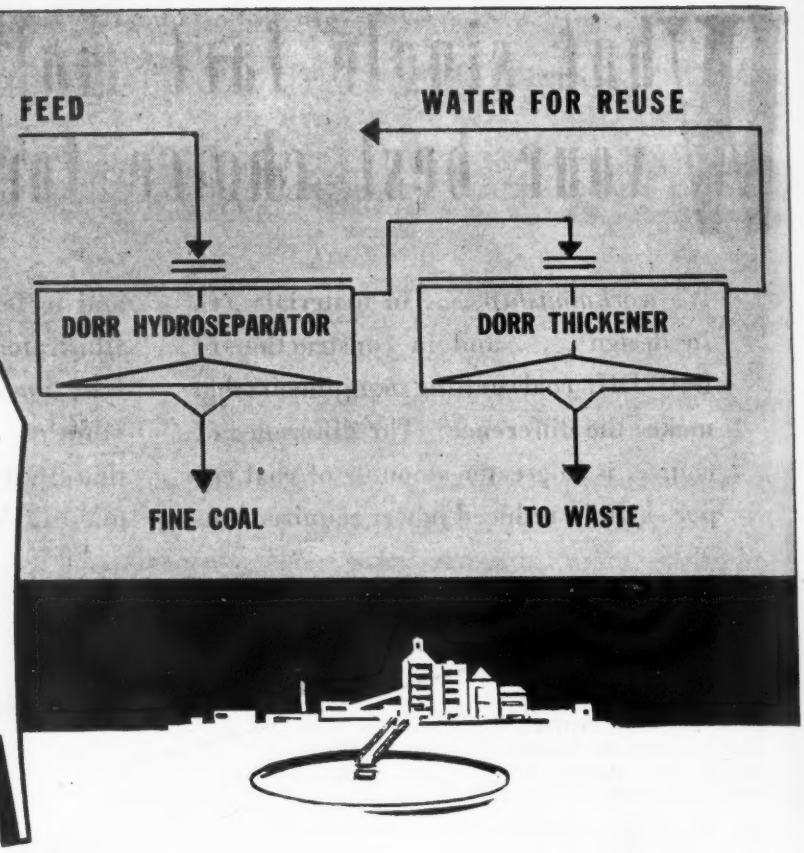


bowdil

"Headquarters for Coal Cutting Equipment"

Canton Ohio

Here's a SOLUTION to stream POLLUTION



This simple flowsheet will eliminate stream pollution while recovering fine coal of marketable size.

This combination of Dorr Hydroseparator and Dorr Thickener performs two important jobs:

Used wash-water is clarified for re-use—a possible economy depending on certain local conditions.

Fine sizes of coal are recovered, which may be blended directly or treated further if required.

Stream pollution, loss of fine sizes, excessive costs—all three are eliminated with this one Dorr installation.

Blueprint Now! FOR TOMORROW'S NEEDS

Upon request, a DORR engineer will visit your plant, study conditions and then make recommendations for equipment designed to meet your particular requirements.

DORR

RESEARCH ENGINEERING EQUIPMENT

ADDRESS ALL INQUIRIES TO OUR NEAREST OFFICE

DORRCO

THE DORR COMPANY, ENGINEERS

NEW YORK 22, N. Y. . . 570 LEXINGTON AVE.
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CHICAGO 1, ILL. . . . . 221 NO. LA SALLE ST.
DENVER 2, COLO. . . . . COOPER BUILDING
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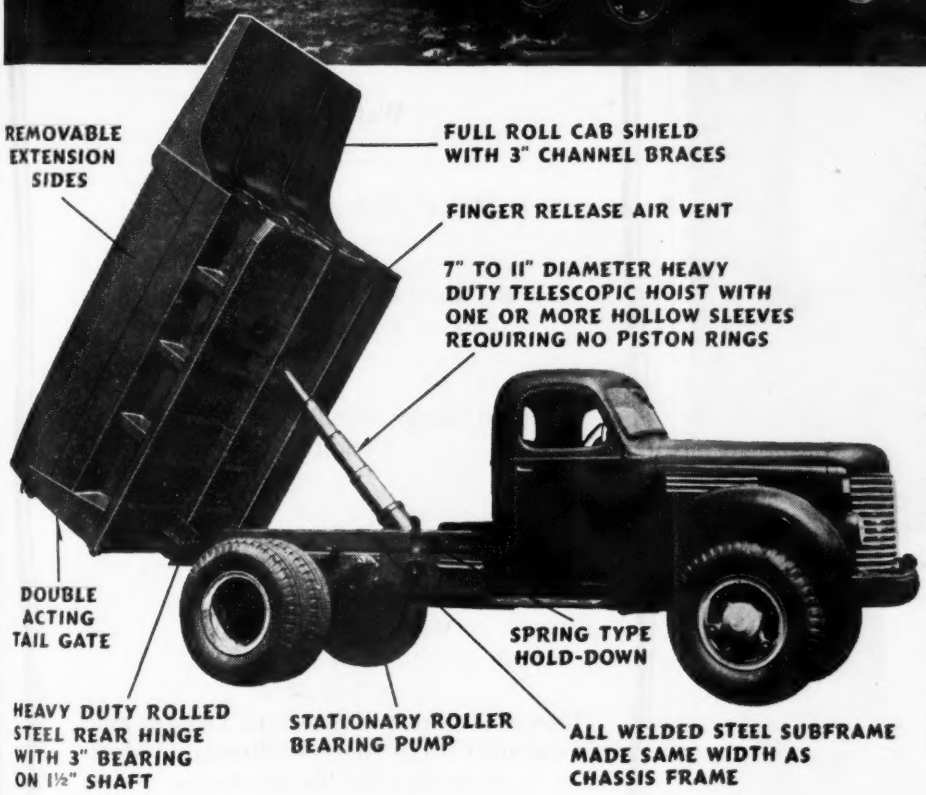
SUGAR PROCESSING
PETREE & DORR DIVISION
570 LEXINGTON AVE., NEW YORK 22, N. Y.

A Profitable Combination—

STRENGTH·SERVICE·ECONOMY

in Penn Dump Bodies



Built-in strength is a basic feature of Penn Dump Bodies. They are fabricated of high resistant steel sheets, arc-welded to a body sub-frame to form a rigid unit. Tailgate and all other body hardware are of forged steel which eliminates breakage.

They are designed for all kinds of rugged service—coal stripping duty, with bodies readily convertible for road and general dump work; for excavating and rock hauling with extra duty bodies made in any length, width and capacity desired; for sand, gravel, garbage or any other kind of haulage and dumping.

Penn Dump Bodies are economical because of their sturdy construction, their adaptability, and their long life of trouble-free performance.

Built to standard and special types for light and heavy duty to suit your purpose—and for any type of chassis.

See your truck dealer, or write for illustrated literature and details.

HOCKENSMITH WHEEL & MINE CAR CO.
Established 1877, Penn, Pa., Phone Jeannette 700

Penn Telescopic Hoists—used on all Penn Dump Bodies—are lighter in weight than any other hoists of equal lifting capacity. The lifting power is applied direct to the body without the use of rollers, arms, levers or cams—no small piston rods and lifting mechanism to wear, bend or twist with the load. Therefore, less working parts, less weight, and lower upkeep.

The hoist cylinder or jack is mounted as near upright as possible to apply the lifting force at the most advantageous point to relieve the chassis frame of undue strain. Pumps are heavy duty roller bearing design with heavy bronze face plates. Capacity is twenty gallons per minute for fast dumping.

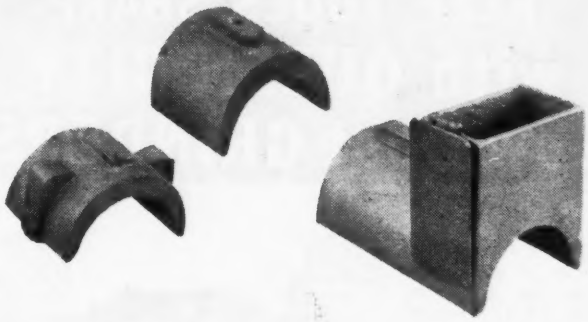
PENN BODY DIVISION

Hockensmith

WHEEL & MINE CAR CO.

Since 1877

Also manufacturers of Oilspok Wheels, mine and industrial cars.



Redesigning BEARINGS

"Flood City" Bronze Parts for mining equipment are the result of years of specialization in coal mine applications.

Since we believe most mines properly lubricate their equipment we normally furnish a hard durable bronze which under test with proper lubrication has shown years of service. We can, however, furnish the softer, self lubricating bronzes where desired.

As pictured above we have also redesigned many parts for more effective service. The right hand journal is made for top oiling, the left hand is designed to eliminate the trouble often found where the key in this particular journal wears and permits the brass to turn. Either type replaces the original standard shown in the center.

Write us about your bearing problems.

FLOOD CITY BRASS & ELECTRIC CO.
JOHNSTOWN, PA.

IMPROVED SUTTON SAND DRYING STOVE

The same time tested principle for drying sand as used in Sutton STANDARD Sand Drying Stoves for more than forty years is employed in the No. 0 Sutton IMPROVED Sand Dryer.

NEW FEATURES

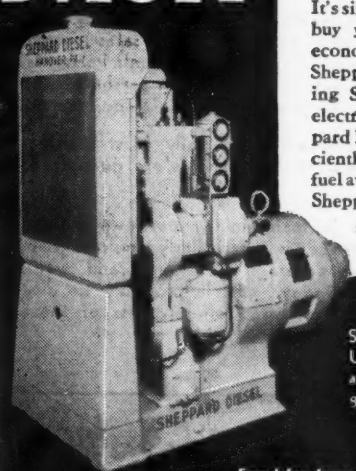
- PERFORATED RING of an entirely new design.
- A FIRE BOWL added between the grate and perforated ring.
- New type FIRE GRATE.
- ASH PIT DOOR EXTENSION to protect clean sand from ashes.
- 3/16" STEEL PERFORATED SKIRTING with Clean out Doors.
- ECONOMY FLAME SPREADER in dome.

Catalog and Prices sent upon request.

INDIANA FOUNDRY COMPANY
950 Oak Street, Indiana, Pa.

Sheppard

ALL-AMERICAN
DIESEL



Horsepower Horse Sense

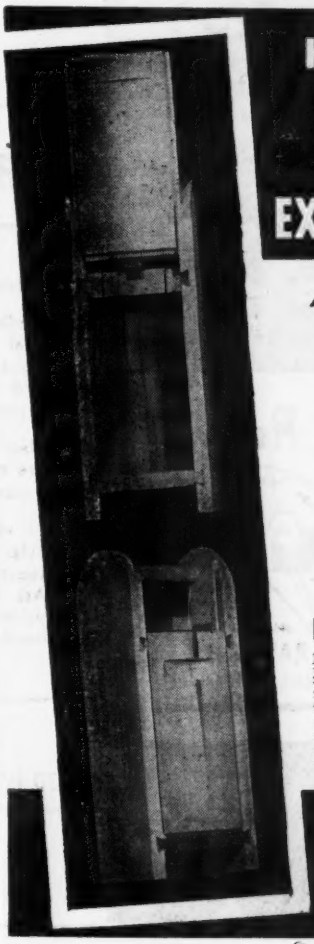
It's simply horse sense to buy your electricity as economically as you can. Sheppard Diesel Generating Sets provide cheap electricity because Sheppard Diesels operate efficiently on the cheapest fuel available. Investigate Sheppard Diesels today.

Sheppard Model 7 Power Unit direct-connected to a 5 kw single bearing generator with exciter.

Send for free literature on Sheppard

POWER UNITS · GENERATING SETS · PUMPING UNITS

R. H. SHEPPARD COMPANY
411 Middle Street, Hanover, Pennsylvania



HAMMOND'S *Latest Type* SAFETY EXPLOSIVE BOXES

Approved by Penna. Dept. of Mines

Boxes are constructed entirely of wood, having no metal parts. They are of tongue-grooved and dovetailed construction, having handle for carrying, and are equipped with automatic lock using rubber bands for a spring.

NOTE: There are NO metal parts . . . conforming to regulations of the Penna. Dept. of Mines.

Important: Prompt deliveries of these Hammond products: safety explosive boxes — wood tamping poles — shovel handles — rope rollers — trolley poles.

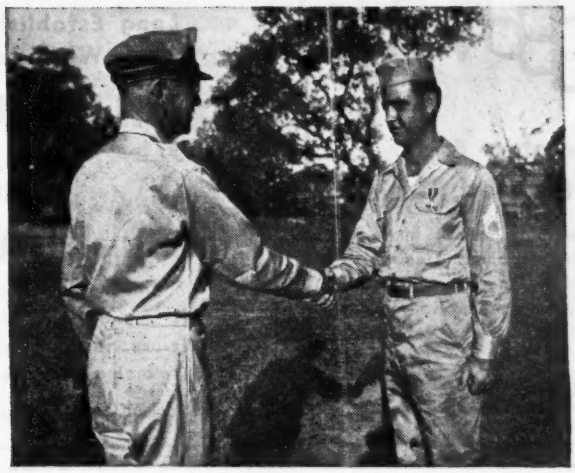
Order today or write for further details.

NET PRICES

Boxes Made in These Sizes

No. 9	Powder Box		9	stick size	1.12
No. 12	"	"	12	" "	1.27
No. 16	"	"	16	" "	1.43
No. 20	"	"	20	" "	1.58
No. 36	"	"	36	" "	2.94
No. 72	"	"	72	" "	4.23
No. 6	Detonator Box		2½x3x6	inside	1.01
No. 8	"	"	2x2½x8	"	1.01

J. V. HAMMOND
SPANGLER, PENNA.



The Pace of Victory Permits Only A Congratulatory Handshake!

American Industry well merits a decoration for its brilliant record in the Mighty 7th! But, as our newly decorated Pacific heroes quickly return to combat, so industrial leaders aren't resting on their laurels. ***Back into Bond action***—they are now busy consolidating recent Payroll Savings Plan gains!

First, many executives are now patriotically working to retain the substantial number of new names recently enrolled during the 7th War Loan. By selective resolicitation, they are urging all new subscribers to maintain Bond buying allotments.

Second, many are also employing selective resolicitation to urge every worker who increased his or her subscription in the 7th to continue on this wise, saving-more-for-the-future basis.

Help to curb inflationary pressures and harvest peacetime prosperity by holding the number of Payroll Savings Plan subscribers—and amounts of individual subscriptions—to the mark set in the Mighty 7th!

The Treasury Department acknowledges with appreciation the publication of this message by

COAL AGE

★ *This is an official U.S. Treasury advertisement prepared under the auspices of Treasury Department and War Advertising Council*

SEARCHLIGHT SECTION

POSITION WANTED

ENGINEER—Age 36, 11 years mining and stripping and 5 years construction experience. Desires position with coal company or stripping contractor in the engineering, product or safety departments. Have mining and assistant mine foremans' certificates. Available about July 1st. PW-315, Coal Age, 330 W. 42nd St., New York 18, N. Y.

BUSINESS OPPORTUNITIES

INACTIVE MINE owner seeks contact with party having loaders and other underground equipment for use in high coal. Will make attractive deal to operate. Describe equipment. BO-316, Coal Age, 520 N. Michigan Ave., Chicago 11, Ill.

FOR SALE or Lease: A going coal mine with an 18 car railroad siding 90 feet from drift mouth, finest quality coal, cutting machine, 2 electric coal drills, fan, hoist, pump, mine cars, tipple, out buildings, and misc. tools. Must sell or lease to highest bidder; partners can't agree. For details write the Mozide Coal Company, Whitesburg, Ky.

3300 A Coal land to lease. Pocahunts fields, adjoining strip mine now operating. We have several openings made 3 to 16 ft. fronts rail road. Liberal contract. Security Land Co., Inc., Cedarville, Va.

WANTED

WANTED COPIES of Coal Age for past 5 years. Box CA-7287, 113 West 42nd St., New York 18, N. Y.

Buy Shovels Fit for Your Job

One (1)—15 cu. yd. Electric Tower Machine.

One (1)—8 yd. Bucyrus-Erie Model 3820 Steam Dragline. 170' Boom.

One (1)—6-8 Yd. Bucyrus-Erie 230 Steam Dragline. 175' Boom.

One (1)—6½ yd. Bucyrus-Erie Model 320-B Electric Shovel.

A 6 to 7½ yard Marion Dragline. Model 7200—built in 1941—110' Boom. One 6 yd. and one 7½ yd. dragline bucket. Electric Controls. *A Real Buy!*

One (1)—5 yd. Marion Steam Shovel Model 92.

One (1)—4½ yd. Bucyrus-Erie Dragline—Class 24.

One (1)—4 yd. Marion Model 125 Electric Shovel.

One (1)—4 yd. Marion Electric Shovel Model 4160.

One (1)—4 yd. Bucyrus-Erie 80B Steam Shovel. 48' Boom. 32' Sticks.

One (1)—4 yd. Bucyrus-Erie Steam Shovel 100C. R.R. Type. 31' Boom.

One (1)—3½ yd. Bucyrus-Erie 175B Steam Shovel. 75' Boom. 48' Stick.

One (1)—3½ yd. Bucyrus-Monighan Steam Excavator and Dragline. 100' Boom.

One (1)—3 yd. 3W Monighan Dragline, 70' Boom. Equipped for electric or diesel operation.

One (1)—3 yd. Monighan Dragline. 80' Boom.

One (1)—3 yd. Monighan Diesel—Cummins 200 HP Diesel Engine. 90' Dragline Boom.

One (1)—3 yd. Bucyrus-Erie 100B steel Shovel. 25' 9" Boom. 18' Dipper Stick.

One (1)—3 yd. Electric Monighan Dragline Excavator.

One (1)—3 yd. Marion 40A Dragline. 90' Boom. Waukesha Hesselman Diesel Engine.

Two (2)—4 yd. Marion Electric Shovels Model 125.

One (1)—3 yd. Model 125 Marion Electric Shovel.

Two (2)—Model 125 3 yd. Marion Electric Shovels with two 3 cu. yd. manganese dipper buckets.

One (1)—2½ yd. Steam Shovel Bucyrus-Erie Model 70.

One (1)—3 yd. Bucyrus Electric Dragline. Model 14. 62' Boom. 14' Extension.

One (1)—2 yd. Bucyrus-Erie Model 50B Crane and Dragline Combination. Atlas-Imperial Diesel Engine.

One (1)—2¼ Bucyrus-Monighan Walker Dragline.

One (1)—3 yd. Marion Electric Shovel Type 4121. 34' Shovel Boom.

One (1)—2½ yd. P&H Electric Shovel. Model 1250.

One (1)—1¾ yd. Marion 37 Electric Dragline.

One (1)—2 yd. Bucyrus-Erie High-Lift Electric. Model 50B. Shovel Front 30'.

One (1)—2 yd. Monighan Steam Dragline. 65' Boom.

One (1)—2 yd. Marion Steam Shovel Model 36 Special.

One (1)—2½ yd. Bucyrus-Erie Steam Shovel. Model 80B. 45' Boom. 36' Stick.

One (1)—2½ yd. Bucyrus-Erie Steam Shovel. Model 80B. 48' Boom. 36' Stick.

One (1)—2 yd. Bucyrus-Erie 50B Steam Crane. 70' Boom.

One (1)—1¾ yd. P&H Model 650 Crane and Dragline.

One (1)—1¾ yd. Marion Electric Power Shovel Model 37.

One (1)—1¾ yd. Marion Steam Shovel Model 37.

One (1)—1¾ yd. P&H Dragline. Diesel powered. Model 705.

One (1)—1¾ yd. Bucyrus-Erie 42B Electric Tunnel Shovel.

One (1)—1½ yd. P&H Model 700B Dragline. 60' Boom.

One (1)—1½ yd. Specially constructed Northwest 104 with long swamp cats.

One (1)—1½ yd. Northwest Model 6 Dragline.

One (1)—1½ yd. Northwest Model 6 Shovel and Dragline Combination.

One (1)—1½ yd. Linkbelt Dragline. 75' Boom.

One (1)—1½ yd. Lima Shovel. A Real Bargain.

One (1)—1½ yd. Bucyrus-Erie 37B Shovel.

One (1)—1¾ yd. Bucyrus-Erie E2 Diesel Dragline. 50' Boom. Atlas Diesel Engine.

One (1)—1¾ yd. Rebuilt Marion Model 371 shovel and dragline combination. 80' Dragline Boom. 23' jib, or a total length of 103' extra wide. Complete set of shovel attachment. This machine was built in 1936 and can be purchased very reasonably.

One (1)—1½ yd. Koehring 601, 65' Dragline Boom. Three buckets.

One (1)—P&H Model 700. 55' Dragline Boom.

One (1)—P&H 700 Gas Shovel.

One (1)—1½ yd. Browning 1940 Diesel Shovel and dragline combination. Powered by Caterpillar D-13000 Diesel Engine. Complete set of shovel attachment. 65' Boom. *A Real Buy!*

One (1)—P&H Model 650 Dragline and Shovel Combination. 50' Dragline Boom. Fairleads.

One (1)—P&H Model 650 Shovel.

One (1)—P&H 600. 60' Boom.

One (1)—Osgood Shovel. 1¼ yd.

One (1)—Osgood Shovel and Dragline Model 60.

One (1)—Northwest 104. 1¼ yd. Shovel, Crane. Backhoe, Fairleads and Gantry.

One (1)—1940 1¼ yd. Marion Model 352 Shovel and Dragline.

One (1)—1¼ yd. Marion Model 450.

One (1)—1¼ yd. Marion Model 40 Gas-Electric Shovel.

One (1)—1¼ yd. Lorain 75A Crane and Dragline.

One (1)—1¼ yd. Lima Model 101. Standard Shovel Front and Dipper Stick.

One (1)—1¼ yd. Koehring #1 Shovel.

One (1)—1¼ yd. Byers Master Shovel.

One (1)—1¼ yd. Bucyrus-Erie Gas-Air Crane #2.

One (1)—1¼ yd. Bucyrus-Erie Gas-Air Shovel.

One (1)—1¼ yd. Browning Crane-Shovel-Dragline. 50' Boom.

One (1)—1 yd. Speed Crane.

One (1)—1 yd. P&H 600 Crane. 40' Boom.

One (1)—1 yd. P&H Shovel Model 600D.

One (1)—1 yd. P&H Model 455. 45' Boom.

One (1)—1 yd. P&H 400 Dragline.

One (1)—1 yd. Osgood Shovel and Backhoe Combination.

Two (2)—1 yd. Northwest Model 105 Shovel and Dragline Combinations.

One (1)—1 yd. Northwest Model 104.

One (1)—1 yd. Model 60 Shovel. 40' Boom.

One (1)—1 yd. Thew Lorain Shovel.

One (1)—1 yd. Lorain 60A Crane and Shovel Combination.

One (1)—1 yd. Northwest Model 4 Dragline. 50' Boom.

One (1)—1 yd. Marion Model 440. Cummins Diesel Engine. 45' Dragline Boom.

One (1)—1 yd. Lorain 60A Shovel.

One (1)—1 yd. Lorain Model 55 Shovel.

One (1)—1 yd. Linkbelt Model K-1.

One (1)—1 yd. Linkbelt Model K-90. 45' Boom.

One (1)—1 yd. Byers Model 29 Crane. 55' Boom.

One (1)—1 yd. Byers "Master" Crane. 70' Boom. Dragline Bucket.

One (1)—1 yd. Bucyrus-Erie GA3 Dragline. 60' Boom.

One (1)—1 yd. Bucyrus-Erie GA2.

Two (2)—1 yd. Bucyrus-Erie Diesel Dragline and Crane Combinations. Atlas Diesel Engine.

One (1)—1 yd. Bucyrus-Erie D2 Diesel Shovel. 45' Boom. Fairleads.

One (1)—1 yd. Austin Shovel-Crane-Dragline-Combination. 45' Dragline Boom.

One (1)—¾ yd. P&H Model 400 Shovel and Dragline Combination. 45' Boom.

One (1)—¾ yd. P&H Model 204.

One (1)—¾ yd. P&H Model 400 Dragline. 35' Boom.

One (1)—¾ yd. Osgood "Commander" Crane and Shovel Combination.

A real bargain Linkbelt Dragline—¾ yd. capacity can be purchased in South Carolina. It has a 50' boom and a ¾ yd. dragline Bucket.

One (1)—¾ yd. Osgood Shovel.

One (1)—¾ yd. Northwest Model 102 Shovel.

One (1)—¾ yd. Northwest Model 3 Shovel and Dragline Combination.

One (1)—¾ yd. Marion Model 7 Dragline. 40' Boom.

One (1)—¾ yd. Thew Lorain Shovel.

One (1)—¾ yd. Lorain Model 45. 40' Boom.

One (1)—¾ yd. Lorain 40 Shovel.

One (1)—¾ yd. Lorain 40 Shovel and Dragline.

One (1)—¾ yd. Koehring 301 Shovel. 35' Dragline Boom.

One (1)—¾ yd. Browning Shovel and Dragline Model K-2. 50' Dragline Boom.

One (1)—¾ yd. Keystone Excavator Model 4-26.

One (1)—1940 ¾ yd. General Shovel and Backhoe Combination.

One (1)—¾ yd. Bucyrus-Erie 1030. 40' Boom. Fairleads for Dragline Work.

One (1)—¾ yd. Bucyrus-Erie 20B Gas Shovel.

One (1)—¾ yd. Bucyrus-Erie 20B Dragline. Diesel Powered. Atlas Diesel Engine. 20' Boom. Fairleads.

One (1)—¾ yd. General Diesel Backhoe and Crane Combination.

One (1)—¾ yd. Linkbelt Speeder Model B-5 Shovel and Dragline Combination. 40' Boom.

One (1)—¾ yd. Linkbelt Speeder Model 25 Shovel-Dragline-Backhoe Combination. 40' Boom.

A ¾ yd. 1939 or 1940 Diesel Linkbelt Speeder Shovel and Dragline Combination—Powered by Caterpillar Diesel Engine. Complete shovel attachment and dragline boom. Rebuilt and guaranteed condition—ready for immediate shipment.

One (1)—½ yd. Unit Shovel and Crane Combination Model 512. 16' Shovel Boom. 12' Dipper Stick.

One (1)—½ yd. Unit Shovel. 30' Boom. Owens Clamshell Bucket.

One (1)—⅝ yd. P&H Model 300A Shovel and Dragline Combination. 30' Boom.

One (1)—½ yd. Orton Crane. 30' Boom.

One (1)—½ yd. Northwest Model 2 Shovel.

One (1)—⅝ yd. Northwest Model 2 Shovel.

One (1)—½ yd. Linkbelt Speeder Dragline and Crane.

One (1)—½ yd. Buckeye Crane. 30' Boom.

One (1)—⅜ yd. Meade & Morrison Shovel and Backhoe Combination.

One (1)—⅝-¾ yd. Linkbelt Speeder B-4. Powered by Caterpillar D7700 Diesel Engine. 35' Channel Type Boom.

One (1)—⅝-¾ yd. Linkbelt Speeder Diesel Shovel and Dragline Combination. Powered by D-8800 Caterpillar Diesel Engine. Built 1938 or 1939.

One (1)—⅝ yd. Linkbelt Speeder Shovel and Dragline. 36' Dragline Boom.

One (1)—½ yd. Insley Model R Full Swing Shovel and Backhoe Combination.

One (1)—½ yd. Insley Half Swing Crane. 30' Boom.

One (1)—⅜ yd. Insley Shovel Model B.

One (1)—½ yd. Hanson Shovel.

One (1)—½ yd. Rebuilt General Shovel and Crane Combination.

One (1)—⅜ yd. General Diesel Shovel and Dragline. Buda Diesel Engine.

Two (2)—Byers ½ yd. Bearcat Cranes. 28' Boom.

One (1)—General Crane only. ½ yd. capacity.

One (1)—General Backhoe and Crane Combination. ½ yd. capacity.

One (1)—⅜ yd. Byers Bulldog Type Crane. 30' Boom.

One (1)—⅜ yd. Byers Bearcat. Half Swing. 35' Boom

One (1)—⅝ yd. Byers Shovel.

One (1)—⅝ yd. Bucyrus-Erie 16B. 40' Boom. Built 1937.

One (1)—½ yd. Bucyrue-Erie 10/20 Crane. 35' Boom. 35' Boom and 10' Extension.

One (1)—⅜ yd. Wilford Shovel and Crane.

One of the best buys is a Universal ⅜ yd. shovel in very good shape located in Ohio.

One (1)—⅜ yd. Universal Shovel.

One (1)—⅜ yd. Lorain Model 27 Shovel. Built 1939.

One (1)—Insley Shovel. ¼ yd. capacity. Type C. Shovel Front 16'. Dipper Stick 10'.

One (1)—½ yd. Insley Shovel and Backhoe Combination. ¾ Swing.

One (1)—⅜ yd. Very late model, full revolving Hanson Model 33 Shovel.

One (1)—⅜ yd. Fundum ¾ Swing.

One (1)—⅜ yd. Universal Shovel. ¾ Swing.

One (1)—⅜ yd. Hanson Chain Crowd Shovel.

One (1)—⅜ yd. Byers Bearcat Jr. Shovel. ¾ Swing. 20' Dragline Boom.

One (1)—⅜ yd. Universal Shovel on six pneumatic tires.

One (1)—⅜ yd. Byers Bearcat Shovel.

One (1)—⅜ yd. Byers Model 40 Shovel. With home-made trailer. Eight tires. 8:25x20 in rear and 7:50x20 in front.

One (1)—⅜ yd. Buckeye Crane. 28' Boom.

One (1)—⅜ yd. Bay City Pup Shovel-Backhoe. ¾ Swing. Six pneumatic tired skeleton trailer.

One (1)—⅜ yd. Bay City Pup ¾ Swing Shovel.

One (1)—⅜ yd. Ohio Shovel Chain Crowd. Live Boom. Full Swing.

One (1)—⅜ yd. Bay City Model 20 Shovel and Backhoe Combination. Built in 1940. With factory trailer on six pneumatic tires.

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READY FOR IMMEDIATE SHIPMENT

4—10-ton Jeffrey Locomotives—(13-ton equipment)
Serial numbers—5203—5758—6220—6221
Motors—2 MH-110, 250 volt B.B.
Axle diameter .....4½"
Inside steel tired wheels....33"
Wheel base .....60"
Height .....38"
Outside armorplate frame
MB-26E Arcmaster Control
(Equipped with gear cases and steel strip resistances)
While these locomotives are now 44" gauge they can be easily changed to 36" or 42" gauge merely by shoving the wheels in on the axles. They have just been taken out of service and are equal to rebuilt locomotives.

1—15-ton Goodman Locomotive—
Serial number 4604
Motors—36-A-0-4-C, 250 volt B.B., 90 H.P. each
Outside armorplate frame..3½"
Height .....38"
Wheel base .....66"
Controller type LM-61
Inside steel tired wheels....33"
Track gauge now 44"—can be easily changed to 36" or 42".
(This locomotive completely rebuilt and guaranteed.)

8—8-ton General Electric Locomotives—
Serial numbers—8406—8407—7534—9465—9844—10381—10382—10383
Motors—HM-822, 250 volt B.B.
Controller type R-109
Height overall .....31"
Draw bar pull.....4000#
Wheel base .....46"
Outside armorplate frame.2½"
Steel tired wheels.....30"
(Equipped with CY-21 floating type gathering reels and cable) The armatures are equipped with Mica Glass Insulated Coils—have steel strip resistances and gear cases. Completely rebuilt and guaranteed.

Frank J. Wolfe

We also have several 6 and 8-ton General Electric Locomotives with HM-801, 803, 821 and 823, 250 volt ball bearing motors, all equipped with CY-21 gathering reels and steel strip resistances. 36" to 44" track gauge. Can be easily changed to any gauge suitable for your requirements.

2—200 KW General Electric Motor Generator Sets, 250/275 volt DC, 1200 RPM, 3 phase, 60 cycle, 2300/4000 volt AC, complete with switchboards and all necessary switchgear, including automatic reclosing circuit breaker for the DC end.

2—Very late type Jeffrey L-400 Loading Machines—purchased new in 1942. Excellent operating condition.

Several 3, 4 and 5-track Steel Tipples and Electric Hoists with 200 to 1500 H.P. motors.

We specialize in buying complete mines that are going out of business or from receivers in bankruptcy, administrators of estates, etc.

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ROTARY CONVERTERS

500 KW AL-CH SYN 275 V. 6 Ph., 60 Cy., 1200 RPM. Pedestal Type, 2300/4000 V. Transformers.

300 KW G.E. SYN 575 V. HCC, 6 Ph., 60 Cy., 1200 RPM, form P, 2300/4000 V. Transformers.

150 KW WEST. SYN. 275 V. 6 Ph., 60 Cy., 1200 RPM. Bracket Type, 2300/4000 V. Transformers.

MOTOR GENERATORS

300 KW WEST. SYN., 275 V., 2200/4000 V., 3 Ph., 60 Cy., 900 RPM, Manual Switchgear.

200 KW G.E. Ind. 600 V. 2300/4000 V., 3 Ph., 60 Cy., 1200 RPM. Manual Switchgear.

LOCOMOTIVES

13-T WESTGHSE., 500 V., 908-C Mts., 36"-44" Ga.
10-T WESTGHSE., 500 V., 907-C Mts., 36"-44" Ga.
10-T WESTGHSE., 250 V., 907-C Mts., 36"-44" Ga.
10-T WESTGHSE., 500 V., 907-C Mts., 36"-44" Ga.
8-T WESTGHSE., 250 V., 906-C Mts., 36"-44" Ga.
8-T WESTGHSE., 500 V., 906-C Mts., 36"-48" Ga.
8-T GEN. ELEC., 250 V., 839 Mts., 36"-48" Ga.

Each unit listed above is owned by us and is available now for immediate purchase.

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★ MINING EQUIPMENT READY FOR DELIVERY ★

GENERATORS

1—200 KW, GE, type TC-6, Rotary Converter, complete with 6600/13200 volt transformers and switchboard equipment.

LOCOMOTIVES

1—6 Ton Goodman, type 30-C, 42 or 44" gauge, 250 volt, with cable reel.

1—5 Ton Goodman, type 8-A, 48" gauge, 250 volt, with cable reel.

1—8 Ton Westinghouse, type S-65, 44" gauge, 250 volt.

1—4 Ton Westinghouse, type 902, 42" gauge, 250 volt.

1—10 Ton Jeffrey, type MH-110, 42" gauge, 250 volt.

1—8 Ton Jeffrey, type MH-100, 42" gauge, 250 volt.

CUTTING MACHINES

1—CR-8 Sullivan Shortwall, 250 volt.
4—35-L Jeffrey Shortwalls, 220-440 volt AC.
2—29-C Jeffrey Arcwalls, 250 volt, top or bottom cutter.
2—112-AB Goodman Shortwall universals, 250 volt.
2—12-AB Goodman Standards, 35 HP, 250 volt.

MISCELLANEOUS

1—Sullivan bit sharpening machine with oil heating furnace.
1—18" x 18" Jeffrey single roll crusher.
1—5' x 8' Fairmont vibrating screen.
1—16" Steptoe shaper complete.
1—17" Smith & Miller Shaper complete.
1—2½' Canedy Otto Radial Drill press.
1—24" Rockford Upright Drill.
1—No. 3 Cincinnati Milling machine with motor, Lima drive, tail stock, and dividing head.
1—Willard Lathe, 12" swing, 60" centers, complete with motor.

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7—Hopper, Twin, 50-Ton
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10—Refrigerator, 40-Ft., 40-Ton
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2—Dump, Western, Automatic, 30-Yd., 50-Ton; lift doors
2—Dump, Western, 20-Yd., 40-Ton; steel floors
4—Dump, K&J, Automatic, 37-Yd., 50-Ton; Lift Doors
12—Dump, K&J, Automatic, 20-Yd., 50-Ton; Lift Doors
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REBUILT & GUARANTEED FOR IMMEDIATE SHIPMENT

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Electric Coal Drills, Mine Fans, Tipple Scales, etc.
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Equipment of all kinds
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300 tons — 100#
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100 K.W.,1200 R.P.M., 250 volt, d.c. Westinghouse Rotary Converter with Transformers and Switchboards
200 K.W., 550 volt, G.E. Converter
3—165 KVA, 6600 volt, G.E. Rotary Trans. Primary Fuse Expulsion Cutouts
1/R 7 x 7 Portable Air Compressor
450 H.P., 2300 volt, 3 phase, 60 cyc. G.E. Synchronous Motor Panel complete Distribution and Current Transformers
5 ampere, 110 volt, Watthour Meters
200, 300 & 600 A, Disconnecting Switches Motors and Control.
Quantity of New Relays

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R. H. BENNEY EQUIPMENT CO.
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16 YD. DRAGLINE:
1—16 Yd. Electric Caterpillar Modern Dragline with 160' Boom.
AIR COMPRESSORS:
(7) Steam 66 ft., 300 ft., 600, 1000 & 1940 ft.
(12") Belted 360, 676, 870, 1000, 1300 ft.
(12) Diesel 105, 315, 520, 676 & 1000 ft.
(6) Electric 1300, 1,500, 2200, 5000 ft.
(14) Gasoline, 10, 160, 220, 210 & 370 ft.
RUBBER CONVEYOR BELTS:
1000' 60", 600' 30", 300' 20", 1000' 42", 900' 48", 1450' 36", 1200' 24", 900' 18", 600' 16", 350' 14"
TANKS:
12,000 and 15,000 gal. and 20,000 gal.
CONVEYOR PARTS:
Idlers, Heads & Tail Pulleys, Steel Frames, Tripper, etc., 14 In., 48 In. Large stock here.
STORAGE BATTERY LOCOMOTIVES:
2½ ton Whitcomb 24 ga. New Batteries
3—5 ton Mancha 30 in. ga.
4—5 ton G.E. 36 in. ga.
3—7 ton Goodman 36 ga. Battery & Trolley
8—6 ton Baldwin Westgh. 42 ga. & 36 ga.
DIESEL GENERATOR:
480 KW 3-60-2300 v. Cooper Bessemer
TROLLEY LOCOMOTIVES:
4—6 ton & 3—5 ton Goodman 36 ga.
3—6 ton Goodman 42 ga.
5—6 ton Westinghouse 42 ga.
10 ton Goodman 42 ga. & 13 ton Jeffrey
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9 Tyler Hummer 3x6, 4x5, 4x8, 4x10
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4x12 Niagara. 3x8 L. B., 5x6 Simplex
CARS:
6—Western 16-20-30 yd. Side Dump
30—50 ton Gondolas
12—50 ton Flat Cars
100—8000 & 10,000 gal. Tank Cars
SHOVELS, CRANES & DRAGLINES:
2 yd. Monighan 60' Boom Walker
2 yd. P & H Model 780 75' Boom Diesel Dragline
2—2¾ yd. 48B Diesel Shovel—Draglines
2 yd. Page 70' Boom Diesel Dragline
1¾ yd. Marion 450 Elec. Shovel
2—120B—4 yd. Elec. Shovel—Dragline
25 ton Browning 50' Boom Loco. Crane
MINE LOADERS:
H23 Sullivan Tunnel Loader
3—5 BU & 7 BU & 12BU 36 or 42 ga. Joy
7 Conway 20A, 30A, 50A, 60 & 75 Muckers
5—Gardner Denver & Elmco Shovels
MISCELLANEOUS:
5'x60' Traylor Rotary Dryer
Clamshell Buckets ¾, 1, 1½, & 2 yd. Cap.
30 ton & 12 ton Vulcan St. Ga. Gas. Loco.
67 ton Gas. Elec. Locomotive
WANTED TO BUY:
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36" x 24' American Grd. Hd. Two Carriages, Q.C.
24" x 16' LeBlond Screw Cutting Engine Lathe, Q.C.

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6' American Triple Purpose, M.D.
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5' American Triple Purpose Plain.

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1—100 Kw Ridgway Synch. Motor Generator Set 275 Volts DC. 3/60/2300 Volts AC, 1200 RPM with AC & DC Switchboards

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LOCOMOTIVES

1½ to 10 Ton 18" to 56" Track Gauge

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CARLYLE RUBBER PRODUCTS ARE NEW, GUARANTEED & LOW PRICED

CONVEYOR BELTING

ABRASIVE RESISTANT COVERS

Width	Ply	Top-Bottom	Covers
48"	8	1/8"	1/16"
42"	5	1/8"	1/16"
36"	6	1/8"	1/16"
30"	6	1/8"	1/16"
30"	5	1/8"	1/16"
24"	5	1/8"	1/32"
24"	4	1/8"	1/32"
20"	5	1/8"	1/32"
20"	4	1/8"	1/32"
18"	4	1/8"	1/32"
16"	4	1/8"	1/32"
14"	4	1/16"	1/32"
12"	4	1/16"	1/32"

Inquire For Prices - Mention Size and Lengths

TRANSMISSION BELTING

HEAVY-DUTY FRICTION SURFACE

Width	Ply	Width	Ply	Width	Ply
18"	6	10"	6	6"	5
16"	6	10"	5	5"	5
14"	6	8"	6	4"	5
12"	6	8"	5	4"	4
12"	5	6"	6	3"	4

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ENDLESS "V" BELTS

"A" WIDTH All Sizes | "D" WIDTH All Sizes
"B" WIDTH All Sizes | "E" WIDTH All Sizes
"C" WIDTH All Sizes | Sold in Matched Sets

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FIRE HOSE

APPROVED SPECIFICATION HOSE
EACH LENGTH WITH COUPLINGS ATTACHED

Size	Length	Per Length
2½"	50 feet	$28.00
	25 "	16.00
3"	50 "	23.00
	25 "	13.00
1½"	50 "	20.00
	25 "	11.00

Specify Thread On Couplings

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RUBBER HOSE

WATER HOSE
Each Length with Couplings Attached

I.D. Size	Length	per Length
¾"	25 feet	$4.25
1"	50 "	8.00
	25 "	6.25
1¼"	50 "	12.00
	25 "	7.50
	35 "	10.50
	40 "	12.00
	50 "	15.00
1½"	25 "	10.00
	35 "	14.00
	50 "	20.00

AIR HOSE

I.D. Size	Length	per Length	Couplings
½"	25 feet	$5.00	$1.50 Pair
	50 "	10.00	1.50 "
¾"	25 "	6.25	2.50 "
	50 "	12.50	2.50 "
1"	25 "	10.00	3.50 "
	50 "	20.00	3.50 "

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Some Steam Engines and Boilers available only slightly above the metal price

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PIPE New & Reconditioned

ALL SIZES for ALL PURPOSES
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PROMPT SHIPMENT FROM OUR WAREHOUSE

MINING MACHINES

2—12 DA 50 HP 250 v. Goodman Shortwall.
12 G3 Goodman AC Shortwall, 220/3/60.
Jeffrey Permissible Top Cutter.

STORAGE BATTERY LOCOMOTIVES

2—6 Ton G.E. Permissible Locomotives 36/44" Ga. O.S. armorplate frame. Inside steel tired wheels, 2-HM 825 Ball Bearing Motors, Type LSBE, Class 2C6 Form C9. 13½' long, 50" high, 69" wide and 44" Wheel base.

Each of the above units equipped with Edison Battery 80 cell A-10—one new in 1940, the other in 1939.

1—5 to 5½ Ton Type D Ironton, 36 or 42" Ga. Low Type.
1—5 Ton Atlas 40" or 44" Ga. with 2 Ball Bearing Motors. Battery box on top of locomotive.
4 Ton 36" Ga. Atlas 2 BB Motors.
4 Ton 36" Ga. G.E. 2 BB Motors.

(Haulage)

13 Ton Westgh. 250 V. 36" or 40" Ga.
13 Ton Westgh. Bar Steel 500 v. 40/42".
10 Ton Jeffrey 500 V. 36/42" Ga.
6 Ton Baldwin West. 250 v. 36/42" Ga. #48747 904 Motors outside bar steel frame, inside steel tired wheels.
2—6 Ton G.E. 500 v. 42/44" Ga. gathering.
2—6 Ton G.E. 250 v. 42/44" Ga. gathering.

SCREENS

2—4" x 5' single deck Tyler Hummer Screens. Type 37 equipped with V-16 Vibrators No. 2860 and 2867 designed for 110 v. AC 15 cy.

Rotary Con. & MG Sets (3 ph. 60 cy.)

2—300 KW G.E. HC 12 Rotary 275 v. 6 ph. with 2300 v. 3 ph. Trans.
70 KW 250 v. S West—100 HP West. 220/440 v.
75 KW 250 v. S West—125 HP Al. Ch. 220/440 v.
35 KW 125 v. S West—54 HP West. 220/440 v.
25 KW 250 v. S West—40 HP Al. Ch. 220/440 v.

ENGINE GENERATOR & TURBINE SETS

65 HP Primm Oil Engine belted to AC or DC Gen.
57.5 KVA Allis Chalmers Gen. 220/3/60—Kerr Tur.
50 KW West. 125 v. DC—Skinner Engine.
50 KW 125 v. DC West. Turbo. Gen.

TRANSFORMERS

Qu.	KVA	Pri. V.	Sec. V.
31	7½	"	"
28	10	"	"
3	50	22000	2200
2	25	2200	110/220
1	37½	2200	110/220
1	40	2200	110/220
1	25 (1 ph.)	2200 v.	440/220

HOISTS

75 HP Lidgerwood sgl. fr. drum—AC or DC Motor
50 HP Thomas sgl. fr. drum—AC or DC Motor
30 HP Carlin double dr. fr.—AC or DC Motor

COAL CRUSHERS

18 x 18 sgl. roll Jeffrey.
18 x 24 and 18 x 30 New Scottdale dbl. roll.

SLIP RING & SQ. CG. MOTORS

HP	Make	Speed	WDG	Type
300	West.	1750	S.R.	CW
200	G.E.	25C	S.R.	MT 412
150	G.E.	600	S.R.	I-M
150	G.E.	600	S.C.	I-L
150	West.	600	S.C.	CCL
150	West.	580	S.R.	CW
125	Al. Ch.	720	S.C.	
100	West.	1750	S.R.	CW
100	G.E.	500	S.R.	MI-25 cy.
100	Al. Ch.	575	S.R.	
40	Triumph	1800	S.C.	TR 11
25	West.	575	S.R.	CW

Other sizes down to 1 HP

DC Motors and Generators 230/250 V.

HP	Make	Speed	Wdg.	Type
175	G.E.	475	ser.	D 109
150KW	Cr. Wh.	550	cp.	
130	G.E.	550	ser.	CO 1812
100	G.E.	480	ser.	MD 108
100KW	West.	900	cp. wd.	S
75KW	West.	900	cp. wd.	S
60	West.	1750	cp. wd.	SK
60	G.E.	600	ser.	CO 2507
60	Cr. Wh.	800	cp.	
50KW	Cr. Wh.	1050	cp.	
40	West.	1750	cp. wd.	SK

PUMPS

4" Harris All bronze Cent. 500 GPM 190' Head with AC or DC Motor.
4" Gould Bronze Fitted Cent. 500 GPM 160' Head with AC or DC Motor.

AIR COMPRESSORS

12" x 10" Ing. Rd. ER 1 355 cu. ft. 100#.
9" x 8" Chg. Pneu. Type NSB 175 cu. ft. 100#.
5½" x 5½" 2 cyl. 100 cu. ft. 100#—AC Motor.

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CARS — CRANES — COMPRESSORS
DRAGLINES — LOCOMOTIVES
SHOVELS—TRACTORS—ETC.

WE WELCOME YOUR INQUIRIES
WE WILL FIGURE WITH YOU ON YOUR SURPLUS

B. M. WEISS CO.
Girard Trust Bldg. Phila, Pa.

FOR SALE
8—HOISTS 250 V. D.C. MOTORS
2—Vulcan 48 Inch Drum 125 HP Motor
1—Vulcan 32 Inch Drum 50 HP
1—Vulcan 28 inch Drum 35 HP
1—Vulcan 18 inch Drum 25 HP
1—Vulcan 27 inch Drum 50 HP
2—Vulcan 24 inch Drum 35 HP

5—Sullivan CE-7 Cutting Machines 250 Volt
200—Rebuilt 2¼ Ton Card Iron Works Mine Cars Timken Bearing Equipped, 36" ga.
50—C. S. Card style 372 Sheaves, Complete

HAYDEN COAL COMPANY
920 First National Bank Bldg.
Denver 2, Colorado

1—5 HP G.E. 250 volts, D.C. Compound Wound Electric Motor—$35.00
1—9 HP G.E. 250 volts, D.C. Crane type, enclosed Electric Motor with back gear and shaft—$125.00
1—Ton Single Drum Belt Hoist, Flory Mfg. Co., 10" diameter, 20" long. Used 3 weeks.—$100.00.
1—#3 Hayward Dwarf Orange Peel Bucket with hammer weight attachment (Never Used)—Will work inside 14" pipe—$100.00.

ACKER DRILL COMPANY
725 W. Lackawanna Ave., Scranton, Pa.

BONDED SCALES, VIBRATING SCREENS, CRUSHERS

15 ton, 22' x 9' Truck Scale	$ 440.00
20 ton, 24' x 10' Truck Scale	$ 575.00
20 ton, 34' x 10' Truck Scale	$ 815.00
26 ton, 24' x 10' Truck Scale	$ 642.00
33 ton, 34' x 10' Truck Scale	$1040.00
40 ton, 40' x 10' Truck Scale	$1565.00
3 ton Tipple Scale	$ 135.00
3' x 6' Single Deck Screen	$ 495.00
3' x 8' Double Deck Screen	$ 685.00
3' x 8' Single Deck Screen	$ 585.00
3' x 8' Three Deck Screen	$ 885.00
Double-Roll Coal Crusher	$ 345.00
Large Double Roll Crusher	$ 795.00
Portable Power Bag & Stacker	$ 600.00

We manufacture over 100 models of scales, vibrating screens, crushers, conveyor stackers. More than 1500 mines have our equipment. Write or wire for catalog and prices.

BONDED SCALE COMPANY, MFRS.
2190 S. Third St., Columbus 7, Ohio

MINE HOISTS

1—Wellman, Keyed Drum, 60" Dia. will coil 4500 ft. 1" rope. 200 or 300 H.P. Motor with Magnetic Control.

1—Vulcan, Shaft Hoist, 72" Dia. Suitable 300 ft. Shaft. Motor with control to suit requirements.

1—Nordberg, Shaft Hoist, 72" Dia. Suitable 200 ft. Shaft. 150 H.P. Motor with Control.

1—Vulcan, Cylindro-Conical, Shaft Hoist. Drum 7'-9' Dia. Suitable 350 ft. Shaft. 400 H.P. Motor with Control.

Other Hoists available to suit all mining conditions.

JONES MINING EQUIPMENT CO.
Empire Building Pittsburgh 22, Pa.

---

450 MINE CARS

Composite, electric welded, rotary dump type. Toncan steel, white oak bottom. Timken roller bearings, square alloy steel axles, 14" wheels. 4 wheel brakes. Gauge 44". Overall length 131", body 110", width 68", Wheelbase 36". Height above rail 42". Capacity 120 cu. ft. level. Swivel type hitchings.

These cars in service now, are offered subject to release August 1st, located within 20 miles Pittsburgh.

JONES MINING EQUIPMENT CO.
Empire Building, Pittsburgh 22, Pa.

FOR SALE

HOISTS

1—Shepard Niles Electric Hoist to raise loading boom conveyors, capacity 2000#, 5 HP, 3 ph, 60 cy, 440 volts, with controls.

1—Ottumwa electric hoist, single rigid cylindro-conical drum, with automatic control, Weight of cage 7000#, Weight of Car 2500#, Weight of Coal 6000#, Lift 310 ft., diameter of rope 1¼". Diameter of drum 60" x 84". Brake, 84" diameter, 8" face, post type, oil operated. Drum shaft bearings 10" x 20". Hoist is equipped with single reduction gears 19 and 229 teeth, 2½ D.P. 11" face. The drum has five grooves on the 60" diameter, 11 grooves up the cone, 4 grooves on the 84" diameter. The drum has a rope capacity of 326 feet plus three dead turns. The hoist is equipped with a 200 HP motor.

1—Ottumwa Electric hoist, single rigid conical drum type, with single reduction herringbone gear, the pinion running between two bearings and connected with motor by flexible coupling. Weight of coal 4000#, Weight of car 1800#, Weight of cage 4000#, total cage travel 210 ft, size of rope 1½". End lift. The hoist is equipped with a 150 HP motor.

MINING MACHINES

4—Goodman Universal Shortwall mining machines, 112AA, 6 ft. cutter bars, 50 HP motors, DC, 250 volts. 36" or 42" gauge.

1—Goodman Universal Shortwall mining machine, 112DB, DC, 250 volts, Cincinnati Duplex chain, 6 ft. cutter bar. Has new extra armature. 36" or 42" gauge.

6—Goodman Standard Shortwall mining machines, 12AA, 250 volts, DC. 6 ft. cutter bars. 36" or 42" gauge.

3—Goodman Longwall mining machines, DC. 36" or 42" gauge.

7—Jeffrey 35A Shortwall mining machines, 50 HP motors, 250 volts, DC. 6 ft. cutter bars, 36" or 42" gauge.

3—Sullivan CE-7 Shearing machines, 250 volts, DC. 7 ft. cutter bars. 36" or 42" gauge.

1—Sullivan CE-7 Shearing machine, AC, 220 volts, 3 ph, 60 cy, 7 ft. cutter bars. 36" or 42" gauge.

1—Sullivan CE-7 Shortwall mining machine, AC, 220 volts, 3 ph, 60 cy, tip-turn truck, 7 ft. cutter bar. 36" or 42" gauge.

LOCOMOTIVES

3—Goodman 5 ton locomotives, type W1-2A5, 36" or 42" gauge. One is complete with electric reel.

2—Goodman 6 ton ball bearing locomotives, type 3314T, 36" or 42" gauge.

1—General Electric Co. 8 ton ball bearing locomotive. HM-839A motors. 36" or 42" gauge.

1—Westinghouse 8 ton locomotive, cast iron frame, 36" or 42" gauge.

1—Jeffrey 5 ton locomotive, cast iron frame, 36" or 42" gauge.

CRUSHERS

2—Jeffrey Crushers, single roll, size 30 x 30.

1—Jeffrey, rotary ring, single roll crusher, 24x36, with 50 HP ball bearing, enclosed motor, 1200 rpm no load, 1155 rpm full load, V-belt driven. Crushes from 20" lump down to ⅛" stoker coal.

AERIAL TRAM

1—B & D, 60 cubic feet automatic dump bucket aerial tram with 1200 feet of 2" interlocking cable and drive.

PIT CARS

120—Timken roller bearing cars, 8' overall length, bumper to bumper, 4'3" overall width, 2'5" overall height, 18½" wheelbase. End dump. One link and pin. 36" gauge.

CENTRIFUGAL PUMP

1—Platt Centrifugal pump, size 5, 4 stage, 500GPM, 358' head.

CONVEYORS

6—Goodman shaker conveyors, type E, complete with pans.

STEEL TIPPLES

1—Tipple and shaker constructed by Allen and Garcia Company. Capacity 3000 tons daily.

2—Tipples—smaller capacity than the one listed above.

Have new and second hand rails and track accessories.

We are distributors for John A. Roebling Sons Company wire rope and fittings.

GAVENDA BROTHERS

CANTON, ILLINOIS

Equipment For Sale

1—Traylor Gyratory Crusher, First Class Cond., Size #410 T.Z. Serial No. 27784.
1—Willey D. C. 50 K. W. Generator direct connected to Ridgeway Steam Engine, 125 V, 400 Amp.
1—Starting Compensator, No. 856644, Type #NR2040, Form A3, Volts 2300 for Synchronous Motor, ATI KVA150, Cycles 60, Phase 3, G. E.
1—25 x 40 Cedar Rapids roller bearing jaw crusher 42" x 8' apron feeder (Iowa).
1—Lippman Pulverizer 24" x 18" feed opening 10 x 10 RPM 1200 to 1800 HP 30 to 45 Capacity 4½ to 13 tons per hour—9 to 23 tons 1" or larger.

Following D. C. Electric Motors:
1—Jantz & Liest Motor, 20 H.P., 110 V, 1050 RPM, Serial #1320.
1—Emerson Motor, 1 H.P. 115 V, 1750 RPM, Serial #P78608.
1—Emerson Regulating Starter, Cutler Hammer.
1—Emerson Motor, 1 H.P. 115 V. 1750 RPM, Serial #78607.
1—Emerson Regulating Starter, G.E.
1—Allis Chalmers Motor, 20 H.P. 110 V, 1000 RPM, Serial #7DK28.
1—Allis Chalmers Starter & Switch.
1—Jantz & Liest Motor, 7½ H.P., 110 V, 900 RPM Serial #1211.

THE KENTUCKY STONE COMPANY, INC.
1616 Heyburn Bldg. Louisville 2, Ky.

FOR SALE
ALL OR IN PART

Sand and Gravel Plant, including Jaw Crusher, Gyratory Crusher, Conveyors, Vibrating Screens, Sand Classifiers, Extra Heavy Scrubber, Water Pumps, Sand Pumps, Feed-O-Weights, Weightometers, Trestle and Tripper and Auxiliary Equipment.

ALSO

Approximately 9 miles of Conveyor, complete with belting, pulleys, troughing and return idlers and drive equipment.

All offered subject to prior sale.

For Particulars Write

Columbia Construction Co., Inc.
Box 579, Redding, California
Telephone Redding 1440

Coal Mine Equipment
FOR SALE

Entire mine equipment located at Industrial Mine, Superior, Colorado, Boulder County, Colorado, consisting of Joy Mechanical Loading Equipment, Mining Machines, Electric Trolley Locomotives, all 250 volt, DC, Pumps, Mine Cars, Rail, Power and Trolley copper wire, Switches, Electric Mine Hoist 200 HP 440 volt, AC Motor with control panel, 2—100 KW M-G Sets 440 volt AC Motors, 250 volt DC Generators with control panel, Tipple screens, Conveyors, Motors AC and DC, Plant Building, Camp Dwellings and Miscellaneous Equipment.

Write or contact* Wilbur Newton, *Trustee

The Rocky Mountain Fuel Co.
1669 Broadway, Denver (2), Colo.
Phone KE-6161

12x12 Deane Holyoke Vertical triplex single acting pump, brass fitted, steel split herringbone gears, 100 HP 230 volt, D.C. motor and starter. Completely overhauled and in first class condition.

American Well Works 5" 650 GPM pump 14 ft. T.P.H., with 5 H.P. 230 volt DC motor. In first class condition.

Cement gun complete with trucks, tank, 13x8 compressor, motor, etc.

ROBT. GAGE COAL CO.
Bay City, Mich.

FOR SALE

One Goodman Standard Shortwall

CUTTING MACHINE

Completely overhauled with new feed drum and shaft, A.C. 220 V., 60 cycle, 3 phase for 36" gage track. Has about 200 ft. cable and 50 ft. hand cable with reel trucks. Machine guaranteed to be in A-1 condition. Stator coils, brand new, dipped and baked.

Wanted to Swap: Two Universal Goodman, tiptable cutting machine trucks (42" gage) in good condition, for two Universal Goodman low-vein, Stub axle (36" gage) trucks. The low-vein trucks must be in good condition, and we will trade even. Will buy out-right if no trade is wanted.

RICHARDSON COAL CO.
Linton, Ind.

FOR SALE

1—Marquette Arc Welder, 220 Volt A.C. 60 Cycle 0 to 250 Amp Welding Range. Good Condition.

BEN HUR COAL CO.
Henryetta, Oklahoma

TOP CUTTING MACHINE

1—Goodman type 724 E J 250 volt. 9 ft. Cutter Bar with two chains, adjustable from 35" to 77" cut.

JONES MINING EQUIPMENT CO.
Empire Bldg. Pittsburgh 22, Pa.

FOR SALE

Diesel Electric Plant 62.5 KVA

3 Phase, 240-480 Volt, Westinghouse Generator Direct connected to Superior Diesel GA6, with switch board $2,500.00

HOLTKAMP ELECTRIC SERVICE
CENTRALIA ILLINOIS

FOR SALE REASONABLE

MONIGHAN WALKING DRAGLINE

with 1¾ yd. bucket. Electric powered. Can be converted to use gas power if desired.

NEW ENGLAND EQUIPMENT CO.
One Howe Street East Brookfield, Mass.

REBUILT EQUIPMENT—READY TO SHIP

MOTOR GENERATOR SET

1—200 kw. West. 600 v. DC 900 rpm Gen. direct. driven through common shaft by 1 - 290 HP 440 v. 3 ph 60 cy. West. Syn. Motor.

ROTARY CONVERTERS

3—150 kw. West. 3 ph. 60 cy. 275 v. 1200 rpm Rotary Converters comp. with transformers, switchboard.

3—300 kw. West. 3 ph. 60 cy. 600 v. 1200 rpm. Rotary Converters comp. with transformers, switchboard.

MINING MACHINES—250 v. DC

1—CE-7 Sullivan 36" ga.

1—Armature for CE-7 Sullivan 250 v. DC.

MINE LOCOMOTIVES

3—5 ton Goodman 30 B 250 v. 36" ga.

1—5 ton Goodman 2600R Gathering Locomotive, 250 v. DC 42 or 44" ga. with cable reel.

1—10 ton Goodman Haulage or Gathering Locomotive, 250 v. 42" ga. Inside wheels.

1—13 ton Westinghouse 42" ga. 250 v. Locomotive, two motor type; single end control.

1—5 ton Ironton Storage Battery Locomotive.

PUMPS

1—American Piston Pump, intake 5½", discharge 4½", size 8x12.

1—90 GPM 225 ft. head, 600 rpm. 2"x2" Blackmer Pump.

1—220 GPM 225 ft. head, 600 rpm. 3½"x3" Blackmer Pump.

SLIPRING MOTORS—3 ph. 60 cy.

HP	Make	Type	Volts	RPM
300	G.E.	I	440	900
260	Burke	EMV-65	440	600
260	Burke	EMV-65	2200	600
150	West.	CW	220/440	490
100	West.	CW	220/440	685
50	Chand.		220/440	1800
50 new	West.	CW	220/440	860
30	West.	CI	220/440	860
30	West.	CI	220/440	787
30	West.	CW	220	900
15	West.	CW	220	870

230 V. DC MOTORS

HP	Make	RPM	Type
1	Louis Allis	1150	INA
1½	Westg.	2200	SK
1½	Westg.	900	CD
1½	Robbins Myers	1750	
1½	Master	3450	DM
2	Thompson	1100	
2	Northern	1000	
2	Reliance	850	
3	G.E.	1700	RC-25
3	West.	860	CD
3	G.E.	1250	RC-26A
3	G.E.	1150	RC-26A
4	Cr. Wh.	1170	CM
5	Cr. Wh.	960	CM
5	Cr. Wh.	980	CM
5	Imperial	540	SK
5	Westg.	850	
5	Westg.	1600	RC
5	West.	1750	SK
7½	Cr. Wh.	875	
75	West.	450	S
10	Cr. Wh.	875	
10	Cr. Wh.	825	CM
10	Cr. Wh.	675	CCM
15½	West.	965	S
35	G.E.	900	DLC

TRANSFORMERS—1 ph. 60 cy.

No.	Kva.	Pri.	Sec.	Make
1	2	6600	110/220	G.E.
3	5	2300	220/440	G.E.
84	7½	2200	220/110	G.E.
32	7½	2200	220/110	West.
12	10	2200	220/110	West.
13	10	2200	220/110	G.E.
2	15	400/30000/50000		American
2	15	2300	230/460	American
2	20	2300	230/460	American
1	20	2300	110/230	West.
2	25	2300	230/460	American
1	25	2200/1100	220/110	West.
2	50	2200/1100	220/110	Maloney
1	50	2200/110	220/110	West.
3	50	6600	575/440/220	G.E.
2	50	6600	550/440	Pgh.
1	50	6600	550/440	Al. Ch.
3	75	2200	220/440	West.
1	100	2300	230	Standard
2	150	2400	240/120	G.E.

AUTOMATIC RECLOSING CIRCUIT BREAKERS

1—300 Amp. 275 volts, type RBI, serial No. 6193.
1—400 Amp. 275 volt, type CRL, serial No. 6327.
1—400 Amp. 275 volt, type ARL, serial No. 7530.
1—600 Amp. Class I, type AHD, 275 v. Ser. No. 8051.

DIESEL ENGINE GENERATOR SET

1—40 kw. 250 v. DC Gen. belt driven by 65 HP Primm Diesel Hor. Engine.

DUQUESNE ELECTRIC & MFG. CO., PITTSBURGH (6), PA.

TROLLEY LOCOMOTIVES and ACCESSORIES

1—**6-ton Jeffrey Mine Locomotive,** armour plate frame, Serial No. 4949, drawbar pull 3,000#, speed 7 M.P.H., track gage 24", wheel location inside frame, wheelbase 40", overall length 149", width frame 44", height above rail 42", approx. weight 13,500#, 2—Type MH-88 motors, 250 volts, MB-16-H Jeffrey controller, equipped with General Electric trailing cable motor and complete equipment. **Price**.....$2,000.00

1—**6-ton Jeffrey Mine Locomotive,** reach gear construction, Serial No. 3300, drawbar pull 3,000#, speed 7 M.P.H., track gage 24", wheel location inside frame, wheelbase 40", overall length 150", width frame 43½", height above rail 50", approx. weight 14,000#, 2—Type MH-117 motors, 250 volts, MB-25-J Jeffrey controller, equipped with General Electric trailing cable motor and complete equipment. **Price**.....$2,400.00

1—**6-ton Jeffrey Mine Locomotive,** Serial No. 7275, drawbar pull 3,000#, speed 7 M.P.H., track gage 24", wheel location inside frame, wheelbase 40", overall length 140", width frame 46", height above rail 30", approx. weight 13,000#, 2—Type MH-88 motors, 250 volts, MB-25-J Jeffrey controller, equipped with General Electric trailing cable motor and complete equipment. **Price $3,000.00**

1—**6-ton Jeffrey Mine Locomotive,** Serial No. 7619, drawbar pull, 3,000#, speed 7 M.P.H., track gage 24", wheel location inside frame, wheelbase 40", overall length 140", width frame 46", height above rail 30", approx. weight 13,000#, 2—Type MH-88 motors, 250 volts, 37-B Jeffrey controller, equipped with General Electric trailing cable motor and complete equipment. **Price**..$3,000.00

1—**6-ton General Electric Mine Locomotive,** Serial No. 10432, drawer pull 3,000#, speed 7.5 M.P.H., track gage 24", wheel location inside frame, wheelbase 60", overall length 148", width frame 31½", height above rail 32½", approx. weight 13,000#, 2—Type HM 801 motors, 250 volts, B-62-A Gen'l. Electric controller, equipped with Gen'l. Electric trailing cable motor and complete equipment. **Price**.....$3,000.00

5—**4-ton Jeffrey Mine Locomotives,** Serial No. 4316, drawbar, pull 2,000#, speed 7 M.P.H., track gage 24", wheel location inside frame, wheelbase 36", overall length 148", width frame 45½", height above rail 33", approx. weight 9,500#, 2—Type MH-96 motors, 250 volts, MB-24-D Jeffrey controller, equipped with Gen'l. Electric trailing cable motor and complete equipment.

Price..$2,000.00 **each**

All above locomotives are in good operating condition and are in operation at present. All are equipped with good headlights, steel tired wheels, trolley pole and wheel, interlocking automatic transfer switch for changing from pole to trailing cable. They are being offered for sale for reason of changing mine haulage from trolley to battery locomotive.

MOTOR GENERATOR SETS:

1—50 KW, No. 217500, 250 V., 200 amp. compound wound, 850 RPM **Westinghouse D.C. Generator,** direct connected to Gen'l. Electric 75 HP, 2200 V., 865 RPM, 19 amp. No. 1414622, Type KT 356, Form B Induction Motor. **Price**....$800.00

1—100 KW, No. 1714156, 250 V., 365 amp. Type SK compound wound **Westinghouse** direct current generator built on common shaft with 150 HP., 8=17155221, 2200 V., 31.8 amp., 900 RPM Westinghouse Synchronous Motor. Motor excitation from generator. **Price**.....$2,000.00

1—200 KW., No. 468125, Class 6 250 750, Type MPC, Form LO, 250 volts, 800 amps., 720 RPM Gen'l. **Electric** direct current **generator** direct connected to Crocker Wheeler synchronous motor No. 114271, Type 301S10, 290 HP., 2300 volts, 3 phase, 350 K.W., 87 amp., 720 RPM., .75 lead power factor, 60 cycle motor. Motor exciter on generator shaft extension, Gen'l. Electric continuous current generator No. 462404, Type KS 3, 24 amp., 125 volts. **Price**.....$4,000.00

New Parts and Cable Reel Equipment—approx. value $6,000.00

TENNESSEE COPPER CO.
61 Broadway, New York

NEW DIESEL-GENERATORS
WE OWN AND CAN SHIP IMMEDIATELY

2—New Caterpillar D13000 diesel engines with electric starting equipment, direct connected to new 75 KW generators each with new 20 KW top mounted, belted generator, complete with instruments, batteries, spare parts, etc. No priority or release required.

L. B. SMITH, INC.
Camp Hill, Pa. **Harrisburg 7331**

FOR SALE

COAL MINE

East Kentucky best Elkhorn coal 46" to 54" equipped 14BU joy loader, steel drop bottom cars. All other regular equipment first class condition. 2½ mile truck haul at present. This will be eliminated when entries are driven about 4000 feet to railroad. 1500 to 2000 acres available. Low royalty. An excellent proposition for any one wanting to get in the coal business.

Wire or write

Box 431, Pikeville, Ky.

BANKRUPT SALE

Large stock of truck, Bulldozer, Steam Shovel, Tractor and motor parts. Stock inventory $24,000.00. Desire to dispose of assets at once.

Property located at Marfrance, in Greenbrier County, West Virginia.

Write, call or wire:

NICKELL KRAMER, Trustee
LEWISBURG, Phone 80 WEST VIRGINIA

FOR SALE
1—36-B Jeffrey Low Vein

CUTTING MACHINE

with truck, 42" track Gauge, 250 volt, D.C. Good operating condition and available for immediate delivery.

BURNWELL COAL COMPANY, INC.
Grantsville, Md. Phone, Grantsville 47

FOR SALE
150 KW

MOTOR GENERATOR SET

275/2300 volts with control
GEORGE M. MERIWETHER
2226 3rd Avenue, North
Birmingham 3, Alabama

FOR SALE

80B Bucycus Steam Shovel in excellent condition
2—Model 07—1 yard Marion Steam Shovels
Model 36 Marion Steam Shovel 1½ yd., Bucket Boom 32 ft. Dipper Stick 24 ft.
Type A Erie Steam Shovel

BENJAMIN COAL CO.
824 Richmont St. Scranton, Pa.

FOR SALE

1—New Fairbanks, Morse & Company built-in Mine Car Scale equipped with automatic Dial, Printomatic, and Electrical Control for motion weighting, purchased new 1943, has never been un-crated.

BEN HUR COAL CO.
Henryetta, Oklahoma

FOR SALE

2 ANTHRACITE COAL BANKS

Containing #4 and #5 silt, approximate tonnage 350,000 tons and 100,000 tons in Schuylkill Region.

WALTER SIDORIAK, *Attorney*
503 Thompson Building, Pottsville, Penna.

2—Jeffrey 24 B—Longwall Machines 250 volts D.C.
2—Sullivan CR 2—Shortwall Machines 250 volts D.C.
10—Jeffrey 35 L—Shortwall 220/440 volts A.C.
1—Sullivan Air Compressor Class WL 44, 210 C.F.M.

BERRETTINI ELECTRIC CO.
378 N. Main St., Plains, Pa.

COAL AGE ADVERTISERS IN THIS ISSUE

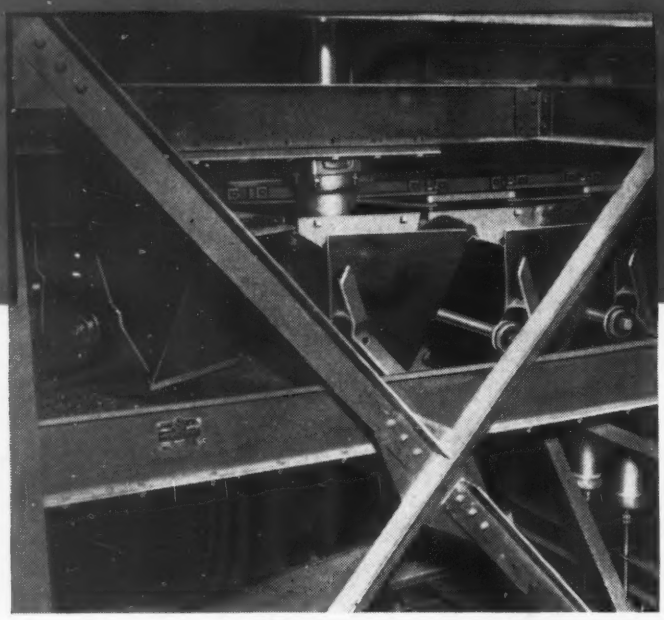
An asterisk preceding manufacturer's name indicates detailed information may be found in the 1944-1945 *MINING CATALOGS*

■

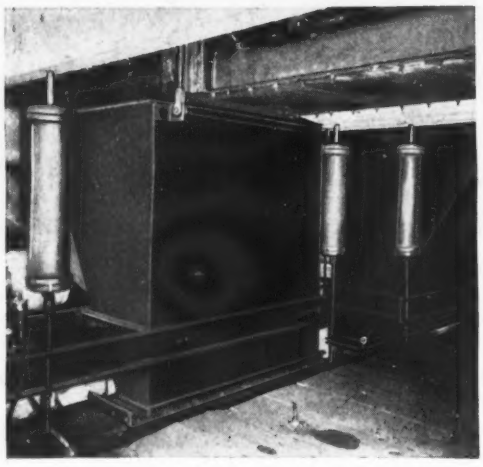
■

SEARCHLIGHT SECTION
Classified Advertising

Announcing
A NEW "RUN-AROUND" CONVEYOR
The LINK-BELT >SIDEKAR-KARRIER<
An Innovation in Modern Coal Handling



Above — Shows idler-sprocket end of SIDEKAR-KARRIER and details of bucket design.

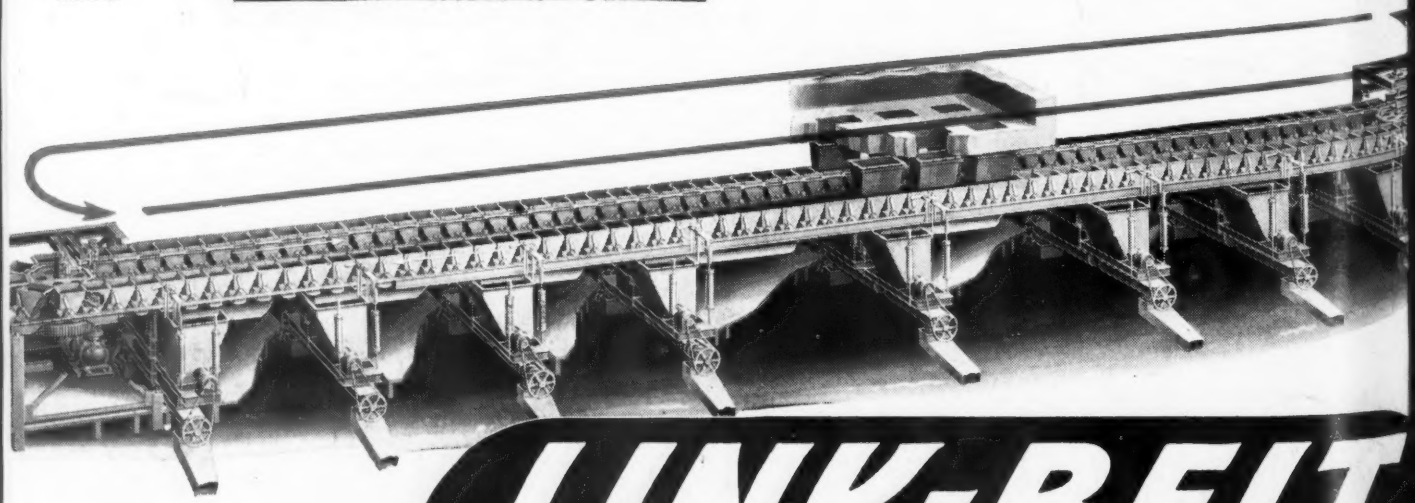


Right — Two of the spring-suspended hoppers underneath the Karrier from which coal is fed to the washing tables.

A basically new type of conveyor of the "run-around" type the SIDEKAR-KARRIER travels in a horizontal plane is self-feeding and self-discharging and requires little head room. Conveyor storage is provided for coal and other bulk materials to be discharged simultaneously in varying quantities to a number of points. Continuous, automatic operation is provided, since the conveyor is self-feeding and self-discharging. The material is carried in buckets supported on rollers, rather than being dragged by flights in a trough; which minimizes wear due to abrasion, reduces chain pull, saves power and effects quiet operation. Segregation as to size is eliminated. A typical installation of the SIDEKAR-KARRIER for coal preparation plants (lower illustration) is that of the Alabama By-Products Corp. where this type of conveyor prevents segregation of coal and provides uniform feed to washing tables. Hopper filling is automatic; hoppers are spring-suspended and when a hopper requires coal, it rises and engages trippers on the undercut gates of the buckets. Folder No. 2068 shows the Link-Belt SIDEKAR-KARRIER in detail. We'll be glad to send you a copy.

LINK-BELT COMPANY

Chicago 9, Philadelphia 40, Pittsburgh 19, Wilkes-Barre, Huntington, W. V. Denver 2, Kansas City 6, Mo., Cleveland 13, Indianapolis 6, Detroit 4, St. Louis 1, Seattle 4, Toronto 8.



Above—Diagrammatic view of SIDEKAR-KARRIER in coal preparation plant showing multiple bin openings and spring-suspended hoppers.

LINK-BELT

>SIDEKAR-KARRIER<